

Aboriginal Heritage Impact Assessment Sunbury South Precinct Structure Plan 1074 Sunbury, Victoria



Report Prepared for Metropolitan Planning Authority

August 2015

Matt Chamberlain



Heritage Insight P/L
1/28 Down Street Collingwood VIC 3066
PO Box 1289 Collingwood VIC 3066

P: +61 3 9417 6803 F: +61 3 9417 7215 archaeology@heritageinsight.com

ABN: 73 116 621 884 ACN: 116 621 88

Executive Summary

This report presents the results of an Aboriginal heritage impact assessment of a Precinct Structure Plan areas – PSP 1074 – situated at Sunbury, just north of Melbourne. The area is known as the Sunbury South PSP (1074), which covers an area of approximately 1800 hectares around the southern side of Sunbury township. The purpose of the study is to provide findings and advice with regard to the Aboriginal heritage values of the PSP area. As part of this a range of tasks were outlined by Metropolitan Planning Authority, including:

- Identifying the location of known Aboriginal sites (within a 10 km radius of the PSP) and any natural features in the landscape that remain places of cultural importance today;
- Collecting, documenting and reviewing oral histories and Aboriginal cultural values relating to the precincts;
- Identifying Areas or landforms which are likely to be of high, medium and low cultural heritage sensitivity;
- Identifying locations that are considered to be significantly disturbed as defined by the *Aboriginal Heritage Act 2006*;
- Undertaking an archaeological field survey with the Registered Aboriginal Party (RAP) (the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Incorporated) to locate known and anticipated Aboriginal places within the precinct, with particular focus directed at locations of proposed key infrastructure;
- Consulting with the Registered Aboriginal Party (RAP), Wurundjeri Tribe Land and Compensation Cultural Heritage Council Incorporated to discuss the results of the assessment, field work and management options for Aboriginal Cultural Heritage within the precinct;
- Using the results of the above to produce an Aboriginal heritage site prediction model for the precincts, which identifies:
 - The location of known Aboriginal places;
 - Sites identified during the survey;
 - Culturally important landscapes and features
 - Historical and cultural knowledge of Aboriginal places;
 - Places and areas of cultural heritage sensitivity.

This report has aimed to define areas of sensitivity for Aboriginal cultural heritage within the Sunbury South PSP 1074 area. The areas of sensitivity are shown in Map 10 and the rationale for them is discussed in the report, and the following future management discussion focusses on them, as well as the requirements of the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007*. It has been highlighted within the report, that the work undertaken for this investigation does not constitute a desktop or standard assessment for any future Cultural Heritage Management Plans that may be conducted within the Sunbury South PSP area. As a result, any future Cultural Heritage Management Plans required by the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007* within the PSP area must complete the full range of assessment required by the Regulations.

The Act and Regulations require that certain activities (defined within the Regulations as ‘High Impact’ activities) that are proposed in areas of Cultural Heritage Sensitivity (also defined within the Regulations – See Map 11) require the preparation of a Cultural Heritage Management Plan prior to commencement, as part of the planning process. For example, ‘Subdivision of land’ is a listed high impact activity (Regulation 46), while areas within 200 metres of named waterways and areas within 50 metres of registered cultural heritage places (among others) are areas of cultural heritage sensitivity (Regulations 23 and 22

respectively). The content and structure of a Cultural Heritage Management Plan is defined by the Regulations and formal Guidelines, and requires several stages of assessment; including Desktop, Standard (Survey) and Complex (archaeological testing) assessments. CHMPs also require detailed consultation with Registered Aboriginal Parties (RAPs) and/or Aboriginal community organisations. The RAP for the Sunbury area is the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc. Ultimately, future urban development within the Sunbury South 1074 PSP area will be guided by the requirements of the Act and Regulations, and the following recommendations address these requirements in the context of the sensitivity zones defined in this report, which are:

High Sensitivity

The zone of high sensitivity defined in this report is known to contain a high concentration of, and is likely to contain additional, sites of a variety of types including ceremonial sites, high-density artefact scatters, scarred trees and quarries. These sites are likely to be larger, more intact and of greater scientific and cultural significance. These factors could have an impact on future urban development within the zone. As a result, recommendations are required that aim to manage the archaeological and cultural sensitivity of the area in terms of the legislative requirements for future developments and in terms of guiding the broader scale of development, including protection of some areas.

Moderate sensitivity

This zone is known to contain a small number of sites, limited to small low density artefact scatters or low density artefact distributions. It is likely to contain additional sites of a limited range in low concentrations. These sites are likely to be lower in density and more likely to be disturbed. This is not likely to have an impact on future urban development within this zone. Nevertheless, recommendations are required that aim to manage the area in terms of legislative requirements for future developments.

Low sensitivity:

This zone does not contain any known Aboriginal sites, but is likely to contain sites of a limited range in sparse concentrations. These sites are likely to be low in density and are more likely to be disturbed. This is not likely to have an impact on future urban development within this zone. Nevertheless, recommendations are required that aim to manage the area in terms of legislative requirements for future developments.

Recommendations

Recommendation 1 – All Zones – Future CHMP requirements

- Irrespective of the area of sensitivity (defined in this report) in which it falls, the necessity for the preparation of a Cultural Heritage Management Plan (CHMP) for any activity will be defined by the requirements of the *Aboriginal Heritage Act* 2006 and *Aboriginal Heritage Regulations* 2007. Map 11 shows all the allotments that currently fall within Areas of Cultural Heritage Sensitivity as defined by the *Aboriginal Heritage Regulations* 2007 and would therefore require a mandatory CHMP for any High Impact Activities. It should be noted however that Aboriginal cultural heritage sensitivity maps are revised frequently and should be checked in future to confirm sensitivity areas. A summary list of High Impact Activities is included in Appendix 1. Where any listed high impact activity is proposed within any allotment that falls within or partly within an area of cultural heritage sensitivity, a mandatory Cultural Heritage Management Plan will be triggered. All future CHMPs must include consultation with the Registered Aboriginal Party for the Sunbury area – the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc,

and information from the Wurundjeri Cultural Values Report for the Sunbury area should be incorporated into any future CHMP within the Sunbury South PSP area.

Recommendation 2 – All Zones - Residential developments, future CHMPs, open space

- Given the nature of archaeological potential in all zones and particularly the high sensitivity zone, and the requirements of Section 61 of the *Aboriginal Heritage Act* 2006 to avoid and minimise harm to Aboriginal cultural heritage, future urban developments within the PSP area should maintain a level of flexibility in planning to allow for the allocation of open space for the protection of significant Aboriginal cultural heritage places in the context of future Cultural Heritage Management Plans.

Recommendation 3 – Aboriginal Cultural Heritage Area 1 – Jacksons Creek and Emu Creek

- The results of this assessment have demonstrated that around two thirds of the known sites within the PSP area are located within 100 metres of a waterway, and large numbers and the greatest variety of sites are found within the Jacksons Creek and Emu Creek corridors – all within the areas of high sensitivity defined in this report. Urban development within these areas should therefore be limited. Substantial areas along Jacksons and Emu Creeks that extend up to and beyond 100 metres from each waterway have been designated as strategically important areas for the protection of Growling Grass Frog habitat, and these areas should also be designated as Aboriginal cultural heritage areas (see Map 12). It is understood that these areas will or may be publicly accessible, but any development required to enable public access remains subject to CHMP requirements set out by the *Aboriginal Heritage Act* 2006 and *Aboriginal Heritage Regulations* 2007, and to the guidelines outlined below in Recommendation 5.

Recommendation 4 – Guidelines for future management of Aboriginal Cultural Heritage Areas

- The following guidelines for future management of Aboriginal cultural heritage areas as outlined in Recommendation 3 and 4 should be adopted:
 - Consultation with the Registered Aboriginal Party – the Wurundjeri Council – should be undertaken in relation to any proposed works with regard to both heritage requirements and cultural matters;
 - High impact activities as defined in the *Aboriginal Heritage Regulations* 2007 (and listed in Appendix 1) should be avoided;
 - Works related to the maintenance and enhancement of natural values should be promoted; and
 - Cultural heritage interpretation should be incorporated where possible and appropriate. Any cultural heritage interpretation should be developed in consultation with the Wurundjeri Council.
 - The areas could also be used as locations for repatriation of artefacts recovered during CHMP assessments and salvage works conducted within the PSP area in future.

Recommendation 5 – High Sensitivity Zones outside Aboriginal Cultural Heritage Areas 1 and 2 – Future CHMP Complex Assessments

- Given the high archaeological potential within the zone of high sensitivity, the likelihood of uncovering subsurface archaeological deposits is also high. As a result, it is extremely likely that all CHMPs within the high sensitivity zones will proceed to complex assessment. Complex

assessments in high sensitivity zones in future Cultural Heritage Management Plans within the PSP area should include an intensive subsurface testing program employing a methodology developed in consultation with the Registered Aboriginal Party – the Wurundjeri Tribe Land and Consultation Cultural Heritage Council Inc.

Recommendation 6 – VAHR Sites

- Any proposed works to any of the VAHR sites within the PSP area, including proposed protective or stabilising works to sites within Aboriginal Cultural Heritage Areas, must be conducted in line with an approved Cultural Heritage Management Plan or Cultural Heritage Permit, and include detailed consultation with the Registered Aboriginal Party – the Wurundjeri Council. Under sections 27, 28 and 29 of the *Aboriginal Heritage Act* 2006 it is unlawful to harm or do an act likely to harm Aboriginal cultural heritage, unless it is in accordance with a Cultural Heritage Permit or approved CHMP.

Recommendation 7 – Proposed Bridge Crossings

- A bridge crossing of Jacksons Creek are proposed within the Sunbury South PSP 1074 area, with five alignment options presented at this stage. As these crossings will pass through zones of high sensitivity, the primary aim should be to select the alignment which utilises previously disturbed ground, although the length of the option and other factors such as number of known sites along the option should also be considered.

Option A passes through ploughed paddocks and apparently less disturbed valley slopes on the east side of Jacksons Creek and into rural land and an existing road reserve along the edge of the escarpment on the western side. Nearby sites include a Low Density Artefact Distribution and artefact scatters.

Option B passes through ploughed paddocks and apparently less disturbed valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes rural land on the western side. Nearby sites include a Low Density Artefact Distribution and artefact scatters and a quarry.

Option C passes through apparently less disturbed valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes rural land on the western side. Nearby sites include quarries and artefact scatters.

Option D passes through an apparently less disturbed gully and valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes rural land on the western side. Nearby sites include artefact scatters.

Option E passes through valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes and rural land on the western side. Nearby sites include artefact scatters.

On the basis of aerial photography, none of the South Options appear particularly more suitable in terms of disturbance.

It should be noted, however, that none of these alignment options was specifically surveyed during this assessment as these locations had not yet been provided, and any final decision on the

preferred alignment should be made in conjunction with the Registered Aboriginal Party – the Wurundjeri Council.

Recommendation 9 – process for ongoing consultation

- Ongoing consultation should be held with Registered Aboriginal Party – the Wurundjeri Council – throughout the development of the PSP, to discuss the progress of planning and development and the implementation of these recommendations. This consultation should take the form of regular updates and meetings attended by a representative of MPA and Wurundjeri elders.

DRAFT

Contents

Executive Summary	i
1.0 Introduction	1
2.0 Registered Aboriginal Party Consultation	5
3.0 Environmental Context.....	7
3.1 Landforms and Geology.....	7
3.2 Climate.....	10
3.3 Pre-contact Vegetation and Fauna.....	10
4.0 Aboriginal History.....	12
4.1 Ethnography.....	12
4.2 Previous Aboriginal Archaeological Assessments.....	13
5.0 Recent Land Use History	17
6.0 Review of Desktop Information and Implications for the Study Area	23
7.0 Field Survey	25
7.1 Methodology.....	25
7.2 Results.....	26
7.3 Summary of sites identified and review of preliminary sensitivity model.....	28
8.0 Aboriginal Heritage Site Prediction Model – Sensitivity Mapping.....	32
8.1 Sensitivity and Site Prediction Model.....	32
9.0 Future Management.....	36
Bibliography.....	42
Appendix 1 – High Impact Activities defined in the <i>Aboriginal Heritage Regulations</i> 2007.....	45

Maps

Map 1: Study area.....	3
Map 2: Current conditions within the Study Area.....	4
Map 3: Showing Land Systems within the Study Area as defined by Jeffery (1981).....	8
Map 4: Geology within the Study Area	9
Map 5: 1750s Ecological Vegetation Classes for the Study Area.....	11
Map 6: Areas previously surveyed within the Study Area	15
Map 7: 50, 100 and 200 metre sensitivity buffers around waterways within the Study Area	24
Map 8: Areas surveyed during field assessment (also shows previous surveys).	27
Map 9: Showing sensitivity within the study area based on the principles of the <i>Aboriginal Heritage Regulations</i> 2007	33
Map 10: Showing Sensitivity zones as defined during this investigation.....	35
Map 11: Allotments where CHMP would be required in the case of a high impact activity, and areas of Cultural Heritage Sensitivity as defined in the <i>Aboriginal Heritage Regulations</i> 2007: Sunbury South PSP.....	40

Map 12: Aboriginal Cultural Heritage Areas as outlined in Recommendation 3	41
--	----

Tables

Table 1: Previous archaeological assessments: regional studies and reports conducted within the study area	13
Table 2: Previous archaeological assessments: relevant localised studies conducted within a 10km radius	14
Table 3: Summary of Registered Aboriginal Places within a 10km radius of the Study Area	15
Table 4: Summary of Registered Aboriginal Places within the Study Area	16
Table 5: Survey Participants	25
Table 6: Properties Surveyed	26
Table 7: Summary of sites found during field survey	28
Table 8: Significance assessments for sites found during the field survey	31

Figures

Figure 1: 1854 plan of the Parish of Bolinda. Note the descriptions of the vegetation conditions.	17
Figure 2: 1850s plan of part of the Parish of Bulla Bulla	18
Figure 3: 1917 topographic map of the Sunbury area showing lack of vegetation and sparse settlement around Sunbury	19
Figure 4: 1938 topographic map of the Sunbury area	20
Figure 5: 1968 Aerial photograph of the study area	21

1.0 Introduction

This report presents the results of an Aboriginal heritage impact assessment of a Precinct Structure Plan areas – PSP 1074 – situated at Sunbury, just north of Melbourne. The area is known as the Sunbury South PSP (1074), which covers an area of approximately 1800 hectares around the southern side of Sunbury township. The location of the study area is shown in Map 1.

The precinct is planned to accommodate around 9,000 dwellings and will also include a major town centre, business and residential precinct, industrial precinct, a potential future railway station to the south of the existing Sunbury train station, as well as a future road creek crossing.

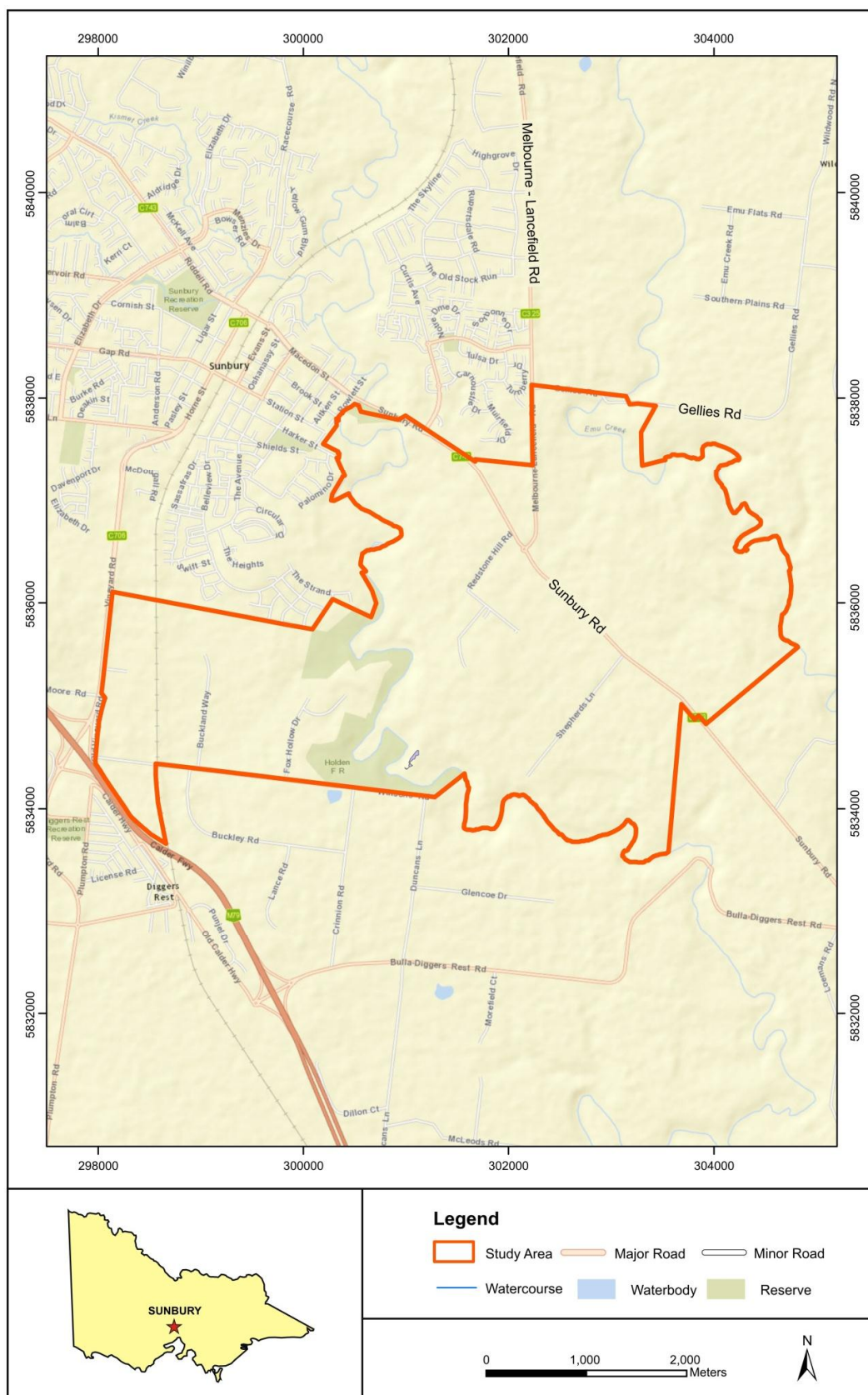
The purpose of the study is to provide findings and advice with regard to the Aboriginal heritage values of the PSP area. As part of this a range of tasks were outlined by Metropolitan Planning Authority, including:

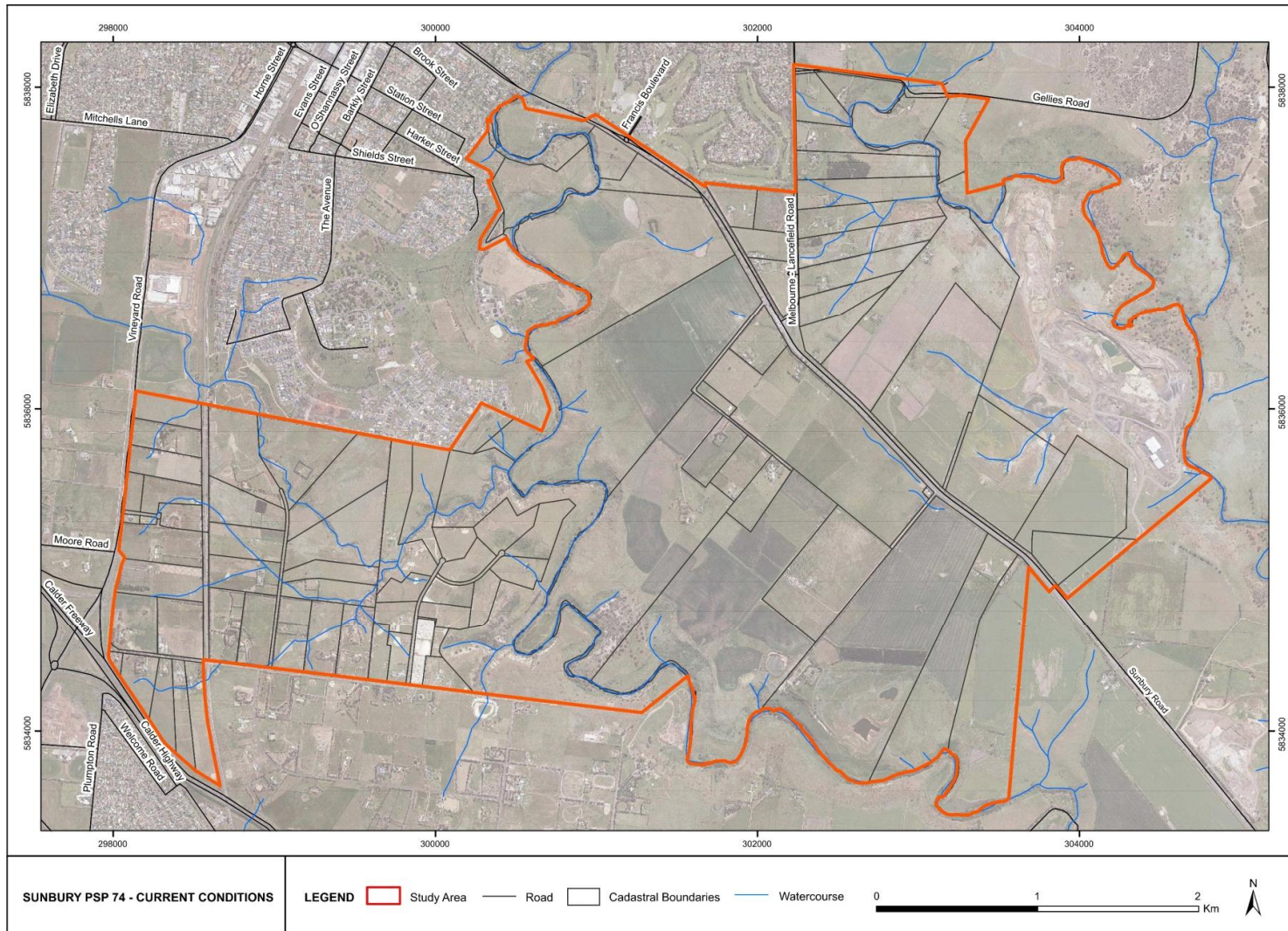
- Identifying the location of known Aboriginal sites (within a 10 km radius of the PSP) and any natural features in the landscape that remain places of cultural importance today;
- Collecting, documenting and reviewing oral histories and Aboriginal cultural values relating to the precincts;
- Identifying Areas or landforms which are likely to be of high, medium and low cultural heritage sensitivity;
- Identifying locations that are considered to be significantly disturbed as defined by *the Aboriginal Heritage Act 2006*;
- Undertaking an archaeological field survey with the Registered Aboriginal Party (RAP) (the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Incorporated) to locate known and anticipated Aboriginal places within the precinct, with particular focus directed at locations of proposed key infrastructure;
- Consulting with the Registered Aboriginal Party (RAP), Wurundjeri Tribe Land and Compensation Cultural Heritage Council Incorporated to discuss the results of the assessment, field work and management options for Aboriginal Cultural Heritage within the precinct;
- Using the results of the above to produce an Aboriginal heritage site prediction model for the precincts, which identifies:
 - The location of known Aboriginal places;
 - Sites identified during the survey;
 - Culturally important landscapes and features
 - Historical and cultural knowledge of Aboriginal places;
 - Places and areas of cultural heritage sensitivity.

The study area is currently predominantly open rural land (Map 2). The PSP area is largely bounded to the east by Emu Creek and to the west and/or south by Jacksons Creek. However, there are several areas where the PSP extends across Jacksons Creeks, the most extensive of which is in the south west of the Sunbury South PSP where the precinct extends across to Vineyard Road and the Calder Freeway. The northern boundary of the PSP area is at Gellies Road, which runs east of Lancefield Road. Watsons Road and the Bendigo rail line provide other substantial non-natural boundaries in the southwestern part of the PSP area.

Section 2.0 of this report discusses consultation with the Registered Aboriginal Party, while Section 3.0 discusses the environmental context of the study area. This is important in helping to assess past

Aboriginal land use. Section 4.0 discusses ethnography and previous archaeological research in the region, while Section 5.0 briefly assesses historic land-use. In Section 6.0 both the environmental context and previous archaeological research are reviewed and the implications for the study area are discussed in terms of areas or landforms that may have high potential to contain Aboriginal archaeological sites within the study area. Section 7.0 outlines the methods and results of field survey and includes an assessment of the scientific significance of the sites identified. Section 8.0 outlines areas of archaeological sensitivity within the study area and provides a rationale for these, while Section 9.0 provides guidelines and recommendations for future management of cultural heritage in the Sunbury South PSP 1074.





Map 2: Current conditions within the Study Area

2.0 Registered Aboriginal Party Consultation

This section provides a brief outline of the consultation undertaken with the Registered Aboriginal Party for the Sunbury area, the Wurundjeri Tribe Land and Compensation Cultural Heritage Council (WTLCHC), through the course of this project. The consultation predominantly took place at meetings held throughout the project and these are documented below. Wurundjeri field representatives also attended during every day of the field surveys and where applicable their comments are noted in the field survey section the report (see Section 7). Email and phone discussions were also held at various times, and while each instance of these is not specifically documented here, Section 2.1 below provides a summary of the outcomes of all consultation.

The consultants met with the Registered Aboriginal Party for the Sunbury area, the Wurundjeri Tribe Land and Compensation Cultural Heritage Council (WTLCHC) on 31st March 2014 to discuss the background and scope of the project, outline desktop study results, and plan for the survey of the PSP area. Present were Matt Chamberlain and Bianca Di Fazio from Heritage Insight; John Petrakos and Mat Garner from Metropolitan Planning Authority; Wurundjeri Elders Ron Jones, Bob Mullins and Allan Wandin; and Wurundjeri Cultural Heritage Officers Alex Parmington and Delta Freedman.

At this meeting Wurundjeri staff and elders highlighted the high cultural significance of the Sunbury area and pointed out the fact that there are several highly sensitive archaeological areas on both Jacksons and Emu Creeks, some of which had not yet been recorded in detail. The proposed survey methodology was discussed and broadly agreed, although Wurundjeri staff also pointed out that the reliability of some earlier surveys was questionable due to a lack of Wurundjeri involvement. One highly significant area on the east side of the Sunbury South PSP, within the HI Quality quarry land, was raised as an area that required further survey.

Another meeting was held with Wurundjeri on 8th July 2014 between Matt Chamberlain from Heritage Insight; John Petrakos and Mat Garner from Metropolitan Planning Authority; Wurundjeri Elders Bob Mullins, Allan Wandin and Robbie Jones; and Wurundjeri Cultural Heritage Officer Amanda Rose. At this meeting the results were discussed and potential recommendations discussed. Wurundjeri requested a chance to review the draft report at this stage prior to providing detailed comments. Following on from this MPA commissioned the Wurundjeri Council to prepare a Cultural Values assessment for the Sunbury area including the Lancefield Road PSP 1075 area and the adjacent Sunbury South PSP 1074. This document was prepared during late 2014 and early 2015.

Wurundjeri Cultural Values Inspection (Freedman and Parmington 2015)

The primary aim of the cultural values report was to document Indigenous cultural values within the Sunbury South PSP 1074 area and the adjacent Lancefield Road PSP 1075 area and to undertake inspections of several specific locations within them. The report compiles ethno-historical information and information provided at informal interviews with Wurundjeri elders to detail the tangible and intangible cultural values found within the Sunbury landscape under specific themes including ecology & agriculture, ceremonial places & places of religious practice, accounts of place, travel and trade routes, family and caring for country.

The report highlighted that the Wurundjeri community view the natural world is a cultural world and as a result, the Wurundjeri people have a special interest in preserving not just their cultural objects, but natural landscapes of cultural importance. This was reiterated in the reports summary of the cultural values recording, which noted that rejuvenation of original ecological conditions is an important element

of caring for country and that “Whilst family history and traditional culture are recollected, the ultimate focus of the Wurundjeri participants is to return the environment to its original condition” (Freedman and Parmington 2015: 31). Two locations within the Sunbury South PSP 1074 area visited by the Wurundjeri during the preparation of the cultural values report were discussed. A plateau on the property at 725 Sunbury Road was identified in the report as an area where Aboriginal/European contact had taken place as it was the location of the former Redstone Hill station, and Aboriginal people had continued to live a traditional lifestyle on the property alongside the station owners during the contact period. Wurundjeri elders also believe the area to be a murrnong farming area. Another area along Jacksons Creek near the proposed creek crossings contains a large rocky cliff which was identified as a pristine remnant of Wurundjeri country, also with some association with the Redstone Hill station.

3.0 Environmental Context

This section provides an overview of the environmental conditions prevalent in the study area. This is used to both describe the study area generally in terms of geology and landforms, and to provide some background with regard to vegetation conditions prevalent in the past.

3.1 Landforms and Geology

The PSP area is located at the eastern end of the West Victorian Volcanic Plains geomorphic division of Victoria. This is a broad division that is characterised by flat to gently undulating volcanic plains, which extend from Melbourne almost to the South Australian border, and are the result of volcanic activity that occurred primarily between four and a half and two million years ago, resulting in numerous relatively thin basalt flows dotted with low hills that are former volcanoes or eruption points.

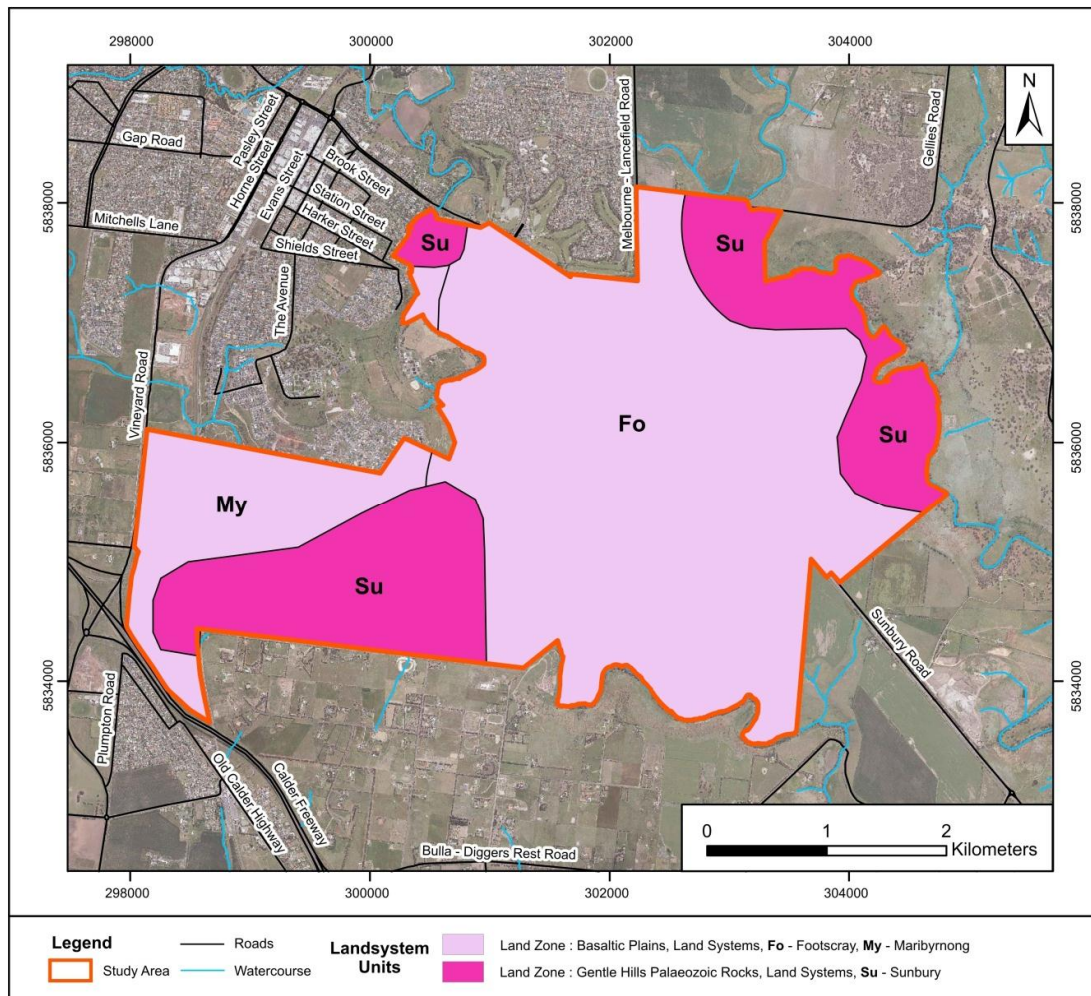
In line with this the majority of the study area is characterised by a surface geology of Pleistocene 'Newer Volcanic' basalt on a plain bounded by Emu Creek to the east, and Jackson's Creek to the west. The plain generally slopes very gently southward before rising relatively sharply to around 260 metres on a low hill known as Redstone Hill in the southern part of the study area. Emu and Jacksons Creeks are part of the Maribyrnong River catchment and both flow south to meet Deep Creek and eventually form the Maribyrnong River. Both are also characterised by generally narrow steep sided valleys with the occasional broad floodplain. The surface geology of these creek valleys usually comprises Holocene alluvium.

There is a large part of the Sunbury South PSP area located on the west side of Jacksons Creek where the geology and topography differs. The west side of Jacksons Creek within the study area is characterised by more undulating land associated with the eastern and southern slopes respectively of Bald Hill and Jacksons Hill and a network of small tributaries of Jacksons Creek, including Harpers Creek. A large part of this area is characterised by a surface geology consisting of Ordovician sandstones and shales.

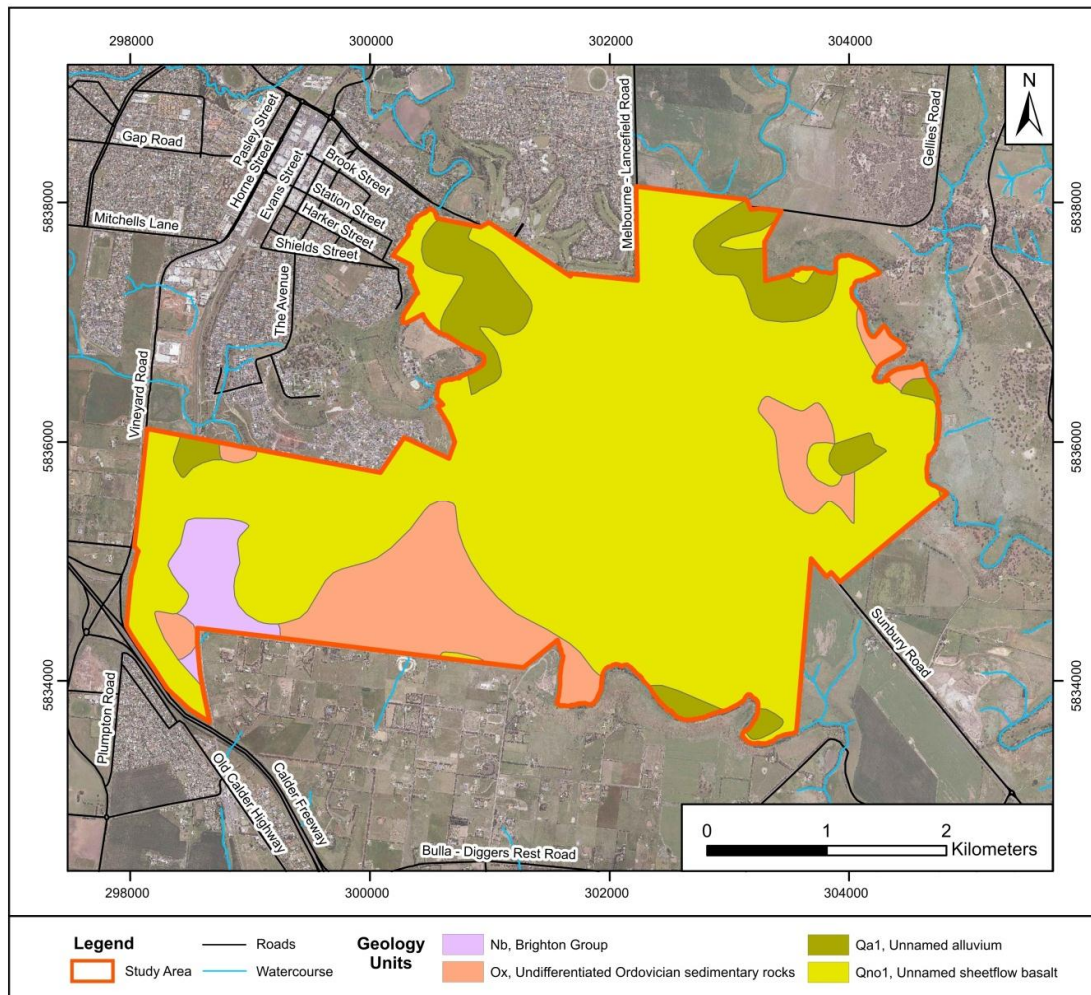
Variations in topographic, geological, soil and botanical conditions at a local level within the catchments north of Melbourne were defined by Jeffery (1981), and the PSP area falls within three separate land systems:

- The Footscray land system - found over the majority of the eastern side of the Sunbury South PSP. This landscape is one of undulating plains formed on basalt with some granitic and silurian wash in places with gentle slopes of 0-3%, at an elevation of 90-250m. The plains are naturally treeless, but are now covered mainly by introduced grasses. Grey, uniformly textured calcareous sodic clay soil is found over most of the landscape, except in the depressions, which have black clay soils. (Jeffery 1981: 43-44).
- The Maribyrnong land system – found on the western side of the Sunbury South PSP. This system includes undulating plains with volcanic cones on Pleistocene basalt at an elevation of 110-240m, generally with slopes of 0-3%. These plains are also naturally treeless. The soils are variable and the different soils are not consistently found in the same locations. Generally a red calcareous sodic duplex soil, typically with a thin loam, clay loam or light clay A horizon over a dark red-brown clay that grades into a heavy deep grey clay, is found on the plains. In the stony areas, the soil is usually shallower and either a red gradational or duplex soil. Black heavy clays are found in these areas though mostly they are found along drainage lines or in depressions where the soil is deeper (Jeffery 1981: 55-56).
- The Sunbury Land system – found predominantly in the southwest corner and along the eastern side of the Sunbury South PSP. This land system comprises low hills (elevation 180 – 410m)

occurring on Ordovician thinly bedded shale and sandstone. It appears that in places basalt once covered these sediments but this is now eroded away. Original vegetation has been largely cleared but remaining native trees include Yellow Gum and Yellow Box on the crests and slopes and Manna Gum, River Red Gum and Grey Box in the wetter areas. The predominant soil is mottled yellow, brown sodic duplex soil found on the slopes. The crests have a similar, but shallower soil, while the swales have either mottled yellow, brown sodic duplex soil or a black clay (Jeffery 1981: 81-82)



Map 3: Showing Land Systems within the Study Area as defined by Jeffery (1981)



Map 4: Geology within the Study Area

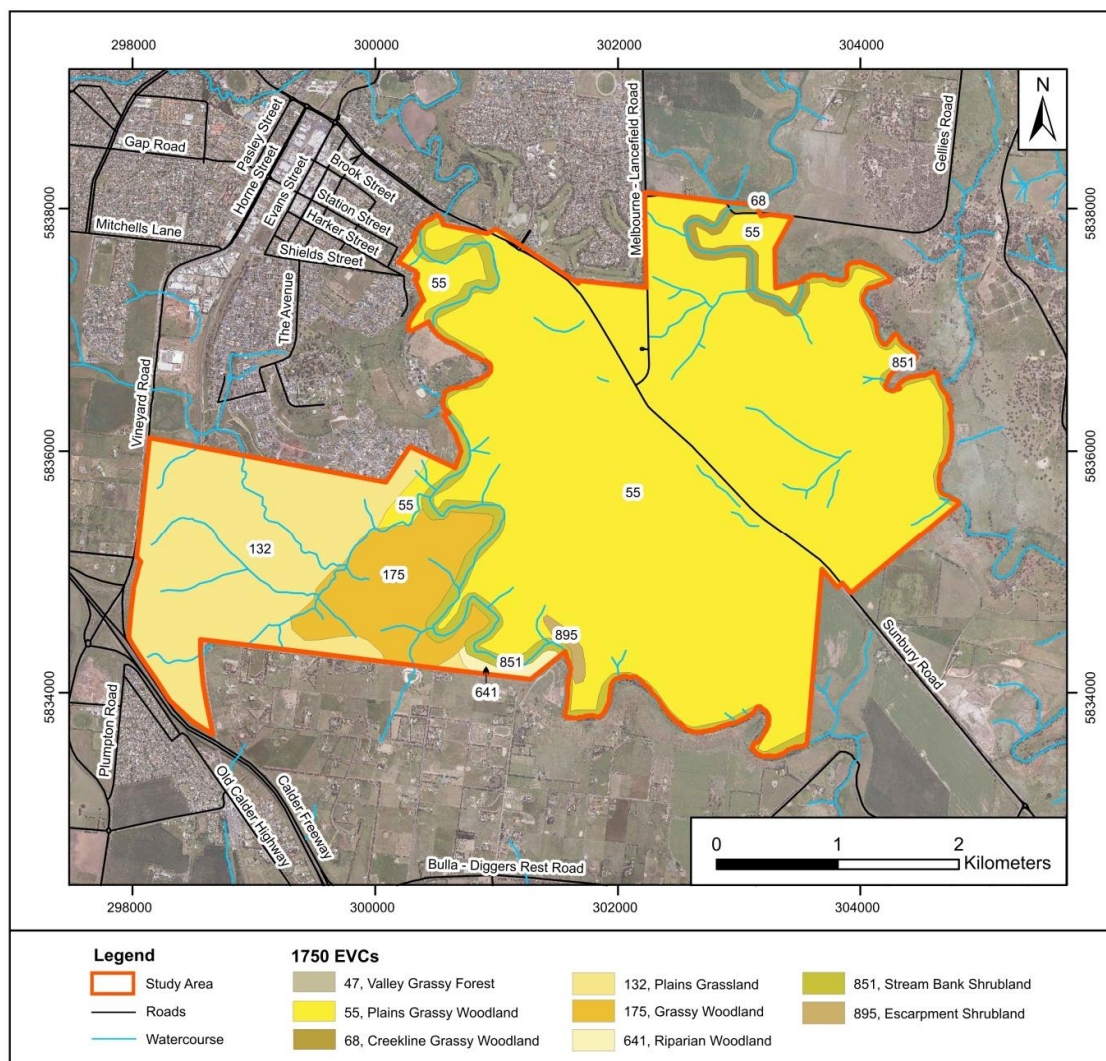
3.2 Climate

The study area has a temperate climate, with warm summers and cool winters. Mean rainfall is highest in spring, with November the wettest month on average. The warmest months of the year occur between December and February, while July is not only the coolest, but also the driest month on average (Weatherzone Website accessed 25/3/2014).

3.3 Pre-contact Vegetation and Fauna

The vegetation over the majority of the study area has been identified as EVC 55 Plains Grassy Woodland at the time of initial European settlement (DSE Biodiversity Interactive Map Accessed 25/3/2014). This vegetation class is generally confined to the plains away from the rivers, while in the Jacksons and Emu Creek valleys, EVC 851 Stream Bank Shrubland, EVC 68 Creekline Grassy Woodland, or EVC 641 Riparian Woodland dominated. This riparian vegetation was occasionally surrounded by EVC 895 Escarpment Shrubland, particularly along Jacksons Creek in the southwest of the Sunbury South PSP.

On the western side of Jacksons Creek, the vegetation was dominated by EVC 132 Plains Grassland, or EVC 175 Grassy Woodland.



Map 5: 1750s Ecological Vegetation Classes for the Study Area

4.0 Aboriginal History

This section of the report discusses historical evidence for Aboriginal people within the study area. It is included to discuss observations of Aboriginal culture at the time of early European settlement, which are useful to the development of a predictive model for Aboriginal site location. However, the accuracy of the written historical record is limited and generalised and in this case it should be used with caution. This Section also provides a detailed review of select archaeological assessments that have been conducted within and around the study area, and a review of all of the registered Aboriginal heritage places within the study area and within a 10 kilometre radius of the study area. This information was obtained from the Victorian Aboriginal Heritage Register (VAHR), accessed through Aboriginal Cultural Heritage Register and Information Services (ACHRIS).

4.1 Ethnography

This section of the report discusses historical evidence for Aboriginal people within the study area. It is included to discuss observations of Aboriginal culture at the time of early European settlement, which are useful to the development of a predictive model for Aboriginal site location. However, the accuracy of the written historical record is limited and generalised and in this case it should be used with caution.

The history of Aboriginal land-use on the property can be gleaned from several different sources, which can include written European historical accounts after 1835, Aboriginal oral history and tradition and archaeological evidence. In this case, the interpretation of the Aboriginal history of the study area relies heavily upon archaeology and written European history.

The Wurundjeri Tribe Land Compensation and Cultural Heritage Council Inc. is the Registered Aboriginal Party for the study area.

Sunbury lies within the country of the *Woi wurrung* language group within the Kulin language area (Clark 1990: 153, 364). The Kulin language area extended from Port Phillip and Westernport north to Echuca and took in the above language group as well as the *Bun wurrung*, *Djadja Wurrung*, *Daung wurrung*, *Ngurai-illam wurrung* and *Wada wurrung* (Clark 1990: 276, 364).

The *Woi wurrung* occupied the Yarra and Maribyrnong watersheds from Mt William and Mt Macedon on the Dividing Range and from the Werribee River east to Mt Baw Baw. The *Woi wurrung* were divided into a number of clans, and the clan that most likely occupied the area around Sunbury at the time of European settlement was the *Marin balug* (Clark 1990: 364-365), who occupied the area between Kororoit Creek, the Maribyrnong River and Jacksons Creek, with headquarters around Sunbury. The *ngurungaeta* (clan head) of the *Marin balug* in 1835 was Bungaree, who was a 'signatory' on Batman's 1835 treaty with the Aboriginal clans of Melbourne, and guardian of the Mt William Quarry (Clark, 1990: 384). Like all Kulin language groups *Woi wurrung* clans were organized into moieties belonging to either Waa (crow) or Bunjil (eaglehawk), and used a marriage system which required individuals to marry outside the moiety, thereby establishing a range of links, reciprocal agreements for the use of resources, and kinship ties with other clans. The *Marin balug* belonged to the Waa moiety (Clark 1990: 382).

In Victoria, rivers are thought to have been a focus of activity for pre-contact Aboriginal clans, not only as a source of fresh water, but also as settlement areas, pathways to other regions and a focus of resource gathering. Creeks and rivers would have provided fish, eels, mussels, waterbirds and roots and tubers. Camp activities in the pre-contact period are thought to have centred on the hunting and gathering of readily available resources, but also included tool manufacture and maintenance, and camp movement was dependent on the availability of game. As a result, any focus on river resources is likely to have been seasonal. For example, for the *Wurundjeri* clans, Presland (1994: 73) has suggested that clans moved between areas seasonally, spending summer months on the banks of a river and its tributaries in open locations along river valleys before moving up into higher land

during the colder months, where shelter and firewood were more plentiful. However, there is little evidence from historical records for the seasonal movements of *Marin baling* people around and outside their clan estate, or to the other factors which influenced the areas of land which they occupied at different times of the year.

As Aboriginal people were dispossessed of their traditional lands, greater involvement with the European economy became necessary for survival (Clark and Heydon 1998: 60). By 1839, much of the *Themeda* and *Poa* grasslands around Melbourne had been devastated by uncontrolled grazing. This resulted in the loss of many staple resources of the *Woi wurrung* people, including the grasses themselves and plant foods such as murrnong, which was almost extinct on the Western plains by this time. Reduction of habitat and uncontrolled hunting of native mammals had also resulted in massive depletion of native animals, such as kangaroo. As a result, an economy of exchange developed whereby Aboriginal people would exchange traditional products for food or services, and this led to an increasing tendency for them to camp at traditional locations in and around Melbourne at all times of the year (Clark, 1998: 60-61). Many of the *Kulin* clans would gather in Melbourne at the junction of Merri Creek and the Yarra River for large ceremonies and resolution of disputes. These ceremonies were held regularly, until an influenza epidemic decimated the Aboriginal population in 1847 (Clark and Heydon 1998: 65). One such ceremony was held in March 1839, when over 500 people from *Daung wurrung*, *Woi wurrung* and *Bun wurrung* clans gathered (Clark and Heydon 1998: 38). A second traditional ceremony was held by *Daung wurrung*, *Woi wurrung* and *Bun wurrung* clans in November 1839 (Clark and Heydon 1998: 38). When moving down to Melbourne for these ceremonies, clans from different *Kulin* language groups would camp at specific locations within and near the present city (Clark and Heydon 1998: 49-53).

In 1860, most of the remaining *Woi wurrung* people were moved to a reserve at Coranderrk, near Healesville. Despite attempts to control and regulate their activities by the Victorian legislature, the people continued to visit many of their traditional places. *Barak*, the *ngurangaeta* of the *Wurundjeri willam* clan, was a prominent elder who passed on much of the traditional knowledge of the *Woi wurrung* by direct communication with his own people and in interviews with the nineteenth century ethnographer, A.W. Howitt. Many of the contemporary Wurundjeri Aboriginal community in Melbourne are descendants of Barak's family.

4.2 Previous Aboriginal Archaeological Assessments

Regional Studies and Reports within the Study Area

The following previous regional and localised studies that included parts of the Sunbury South PSP 1074 area were reviewed to develop an understanding of the archaeological sensitivity of the study area.

Table 1: Previous archaeological assessments: regional studies and reports conducted within the study area

Author/s	Results/Sensitive areas identified
Murphy (1995/1996)	Study of 12,000sq.km. northwest of Melbourne. Areas of sensitivity defined on: <ul style="list-style-type: none"> • Areas of level to gently sloping land in any landform; • Level areas (within 200m) of either an ephemeral or permanent water supply; • Areas where stands of mature native trees exist; • Outcrops of naturally occurring silcrete, greenstone or quartz; • Outcrops of sandstone or granite; • Areas which possess natural rock shelters or caves.
Sutherland and Richards (1994)	Study of Sunbury Area. Jacksons Creek Corridor identified as an area of High Sensitivity. Site types expected are isolated artefacts and small to very large artefact scatters, scarred trees, earth rings and stone quarries, as well as significant undisturbed buried deposits.
Long et al (2005)	<ul style="list-style-type: none"> • Within 50 metres of the east bank of Jacksons Creek: HIGH sensitivity; • At the top of the Jacksons Creek Valley, extending 50 metres from the

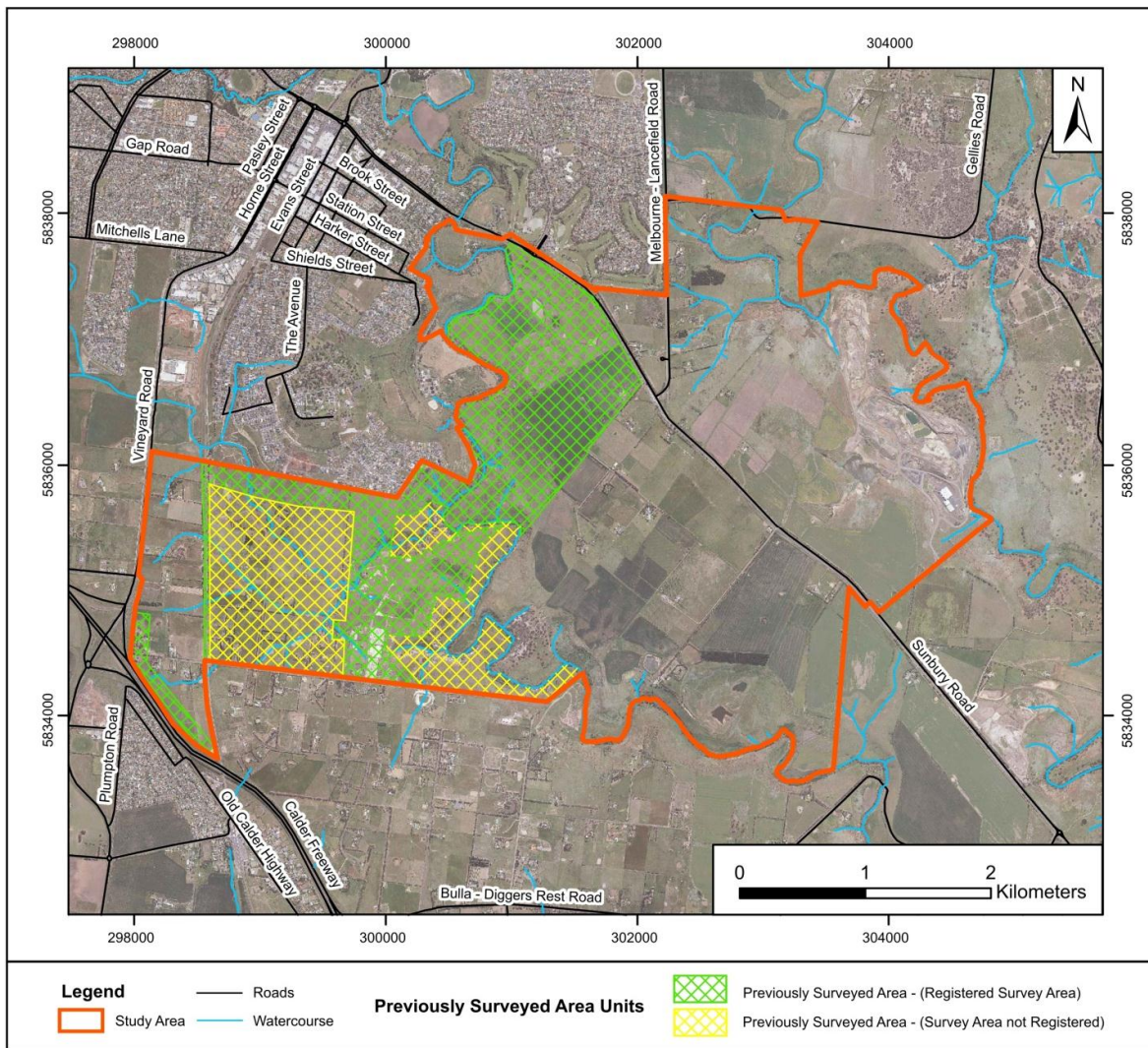
	escarpment edge: MODERATE – HIGH sensitivity; <ul style="list-style-type: none"> Floodplain and escarpment of the Jacksons Creek Valley: LOW – MODERATE sensitivity; Remainder of the study area on the volcanic plain: LOW sensitivity.
Matthews et al (2006)	Areas of sensitivity on spurs overlooking confluence of Jacksons Creek and a small tributary
Noble et al (2010)	Small tributary watercourses identified as sensitive
Du Cros and Associates (1992) and du Cros (1993)	Areas of sensitivity along a tributary of Jacksons Creek, and parts of the study area in closest proximity to Jacksons Creek

Localised - Other Reports within a 10km radius.

Over 200 archaeological reports have been completed within a 10km radius of the PSP area, including over 170 that have included a field investigation component. However, aside from around 30 reports in the immediate Sunbury area, and a small number of reports in the Diggers Rest area, the majority of these reports relate to areas on Melbourne's urban fringe – particularly in the Craigieburn and Caroline Springs areas. Although these areas are in the same broad geomorphic division and land systems as the current study area, they frequently do not contain the same or similar topographic conditions. The reviews below therefore focus on either geographical proximity or selected studies or groups of studies in broadly similar landforms to those found within the study area within the 10km radius (such as the upper Maribyrnong River, Jacksons Creek or Deep Creek Valleys and surrounds; similar basalt hills/eruption points as those found in and around the current study area).

Table 2: Previous archaeological assessments: relevant localised studies conducted within a 10km radius

Author/s	Results/Sensitive areas identified
Rhodes and du Cros (1989)	Areas of archaeological sensitivity identified on several sections of floodplain along the river valleys of Jacksons Creek and Deep Creek
Xibberas (1991)	Floodplain; all areas within 100 metres of Jacksons Creek identified as sensitive
Rhodes (2000)	Alluvial terraces and escarpments associated with Deep Creek identified as sensitive
Weaver (2006)	Spurs leading down to Deep Creek considered likely to be sensitive
Shultz and Donati (2012)	Elevated flat overlooking Jacksons Creek identified as sensitive
Marshall and Webb (2001) and Hyett and Tucker (2005)	Tributaries of Jacksons Creek identified as sensitive
Barker (2011)	Disturbed imported artefacts identified
du Cros and Associates (1992b), du Cros (1995), and Porch and du Cros (1996)	Areas of sensitivity defined; <ul style="list-style-type: none"> within 150m of water courses along the creek lines on high ground, particularly around rocky summits of large hills or knolls
Schlitz et al (2006) and Griffin and Ward (2008)	Silcrete quarry site identified
Tucker et al (2007)	Small disturbed artefact scatters identified on volcanic plains
Howell-Meurs and Walker (2012a, 2012b, 2012c and 2012d)	Heavily disturbed small artefact scatters identified on volcanic plains
Lane (1996)	Middle and upper slopes of hill/eruption point identified as sensitive



Map 6: Areas previously surveyed within the Study Area

Previously Recorded Aboriginal Archaeological Sites Near the Study Area

The Victorian Aboriginal Heritage Register (VAHR), accessed through Aboriginal Cultural Heritage Register and Information Services (ACHRIS), was searched on March 17, 2014 as part of this Cultural Heritage Assessment for the Study Area.

Many Aboriginal sites have been recorded within 10 kilometres of the Study Area. There were 1257 registered Aboriginal site components within 10 kilometres and the majority of these were artefact scatters.

Table 3: Summary of Registered Aboriginal Places within a 10km radius of the Study Area

Component Type	Frequency (No.)	Frequency (%)
Aboriginal Cultural Place	4	0.3
Aboriginal Historical Place	1	0.075
Aboriginal Human Remains (Burial)	1	0.075
Artefact Scatter	789	62.8
Earth Feature	39	3.1

Low Density Artefact Distribution	310	24.7
Object Collection	40	3.2
Quarry	30	2.4
Scarred Tree	41	3.2
Stone Feature	2	0.15
Total Components	1257	
Total Registered Places	880	

The above table tends to place a heavy emphasis on Low Density Artefact Distributions. When the 880 registered places are analysed though, it is still clear that the majority of sites within a 10km radius are stone artefact scatter sites, with 799 of the 880 registered places (90%) having artefact scatter or LDAD as their primary component, well clear of scarred trees (40 sites), quarries and earth features (15).

In terms of the distribution of these 880 sites, there are concentrations of sites along major waterways including Jacksons, Deep, Emu, Kororoit, Riddells, Aitken and Taylors Creeks, and the Maribyrnong River. Sites or clusters of sites are also in evidence on or near high points such as the numerous volcanic eruption points across the volcanic plains north and northwest of Melbourne

At a more localised level (see Table 2) the dominance of artefact scatter sites is more pronounced, with artefact scatter sites making up over 90% of the registered site components within the study area. Similarly, the frequency of quarries is higher, with quarries making up almost 7% of the registered site components. Again there is also a concentration of sites along waterways, including tributaries of Jacksons Creek.

Table 4: Summary of Registered Aboriginal Places within the Study Area

Component Type	Frequency (No.)	Frequency (%)
Artefact Scatter	108	90.8
Earth Feature	2	1.7
Quarry	8	6.7
Scarred Tree	1	0.8
Total Components	119	100
Total Registered Places	108	

If viewed in terms of site types then the occurrence of stone artefacts in sites is even higher. Eleven of the sites are multi-component sites containing artefact scatter/quarry (7 sites), artefact scatter/earth feature (2 sites), and artefact scatter, quarry/scarred tree (one site). This clearly demonstrates that stone artefacts or artefact scatters are present at all of the registered Aboriginal Cultural Heritage Places within the study area. Despite the frequency of the stone artefact scatters in the study area, potentially the most significant sites in the broader Sunbury area are those sites referred to as the Sunbury Earth Rings, which are concentrated along the Jacksons Creek corridor to the north of the study area. The earth rings are regarded as one of Australia's most important archaeological sites, and are characterised by a shallow, circular, dish-like hollow earth structure, and vary between 15 and 25 metres in diameter. Although the specific function of the Sunbury Rings is not known, information from similar sites across Australia and from oral histories suggests that they were the focus of ceremonial activity such as initiation rites.

Another important site type in the region is quarries. There are eight quarries in the study area, and a number of these (five silcrete quarries) are located in close proximity to each other along a stretch of Jacksons Creek in the Sunbury South PSP.

5.0 Recent Land Use History

This section is included to provide a brief overview of recent land-use history within the study area in order to gain a general picture of the likely disturbances that have impacted on landforms in the post-contact period. In the context of such a large area as the Sunbury South PSP 1074 area, this overview is necessarily limited and relies on a narrow range of historical documents such as parish plans, historical maps and aerial photographs.

Squatting runs were taken up in the Sunbury region during the earliest period of European settlement in Victoria, with Samuel and William Jackson, Henry Howey, George Evans, and G.S. and R. Brodie, establishing runs at Sunbury, Redstone Hill, Emu Bottom and Bulla respectively (Spreadborough and Anderson 1983: 259-263). Grazing was the primary activity taking place within the activity area at this time.

Much of the activity area was surveyed and subdivided in the early 1850s. An 1854 Parish Plan for the Parish of Bolinda (Figure 1), which includes the very northern part of the activity area, shows that the majority of the land between Jacksons and Emu Creek was covered in “Gum and She Oak Forest”. This plan also has a dotted line which marks the boundary of this forest, and this extends southward into the adjoining parish; Bulla Bulla. A Bulla Bulla plan, also dated to the 1850s (Figure 2) shows the area on the east side of Emu Creek as alternatively “thinly timbered” and ‘thickly wooded’. Although this is outside the activity area the combination of these two maps indicate that the study area had not been cleared at this point.

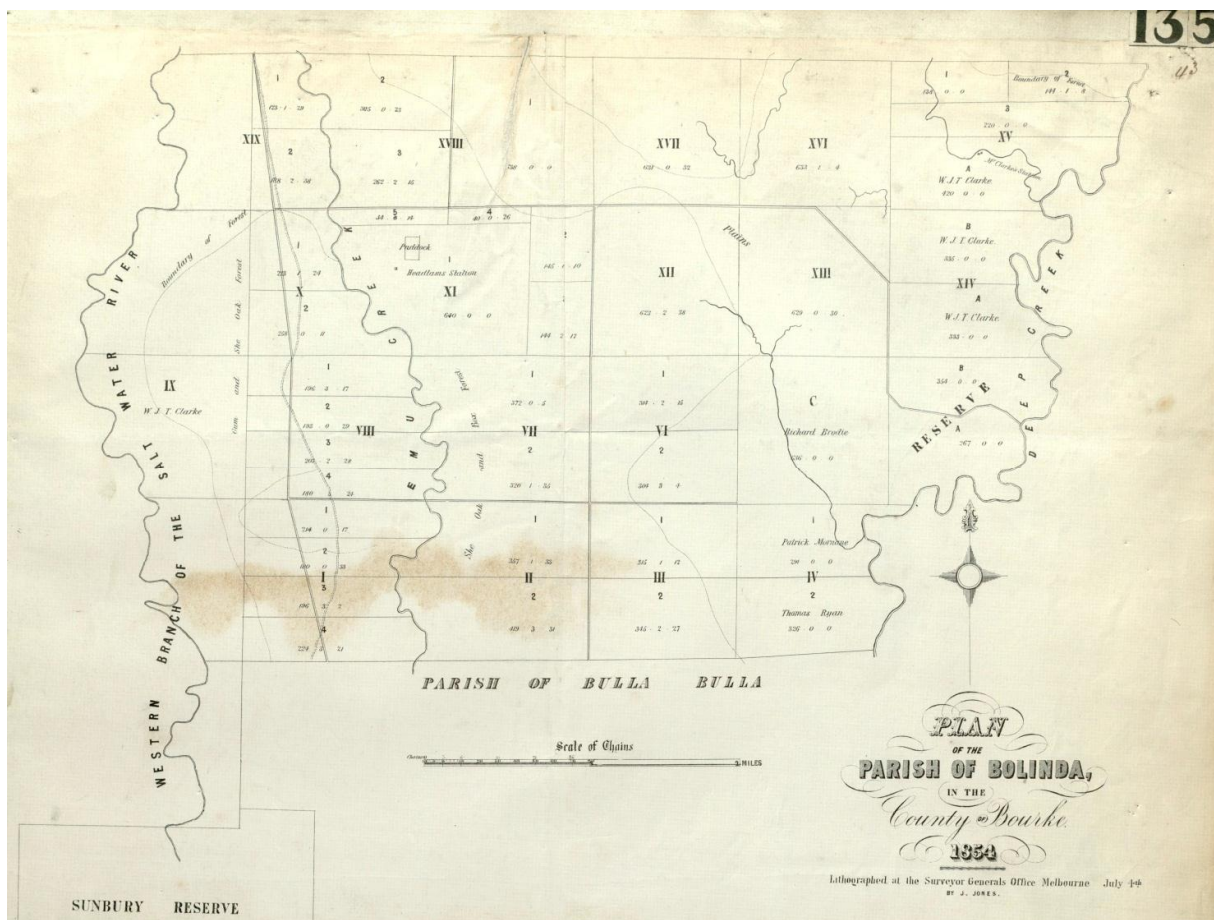


Figure 1: 1854 plan of the Parish of Bolinda. Note the descriptions of the vegetation conditions.

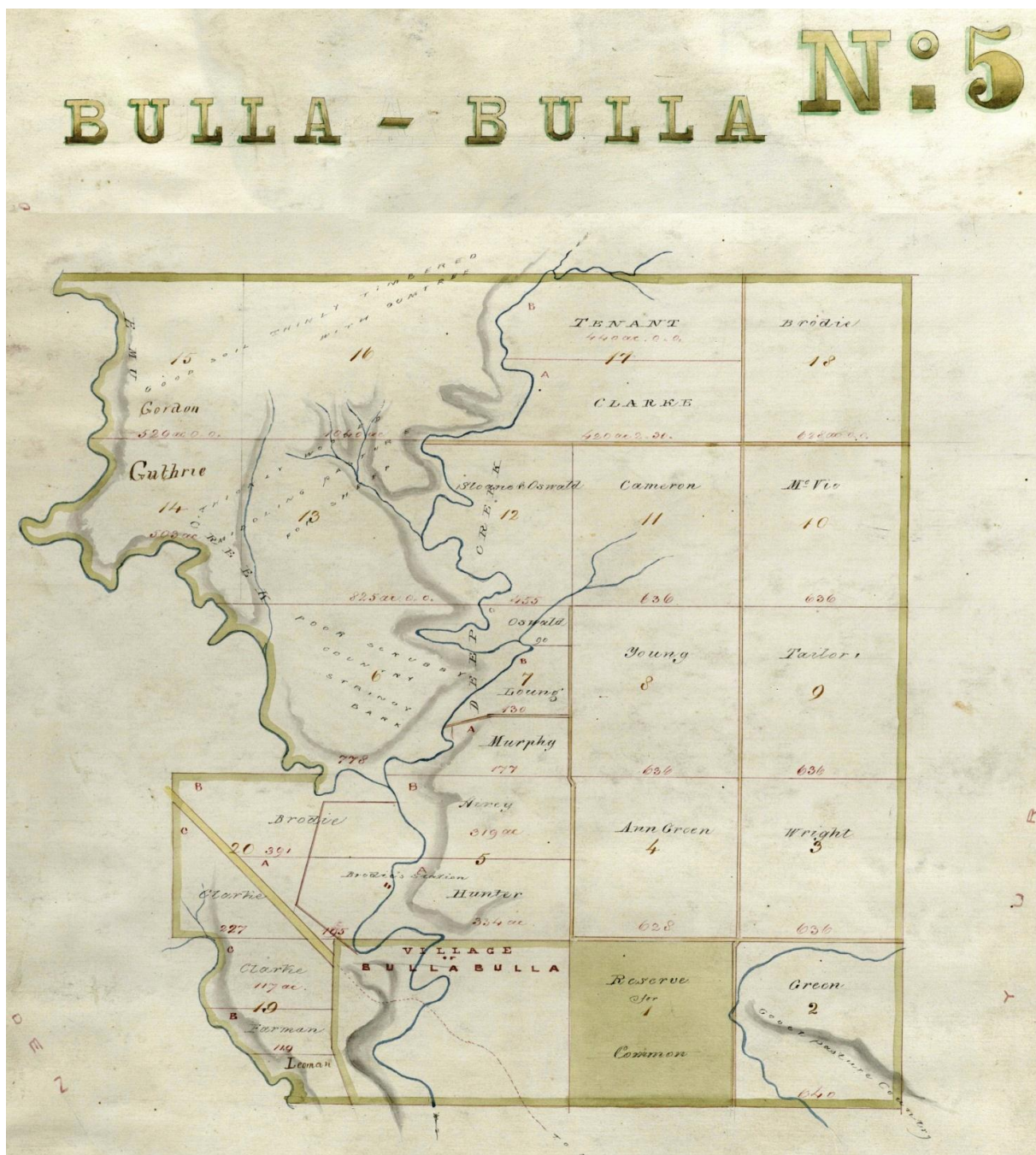


Figure 2: 1850s plan of part of the Parish of Bulla Bulla

By the early twentieth-century, clearance of vegetation had taken place throughout much of the study area. Two topographic plans dating to 1916 and 1938 (Figures 3 and 4) show only pockets and patches of timber, and only sparsely scattered houses. Similarly, an aerial photograph of Sunbury dating to 1968 (Figure 5), shows that settlement remains relatively sparse and there is no clear evidence of any major ground disturbing activities other than farming/grazing.

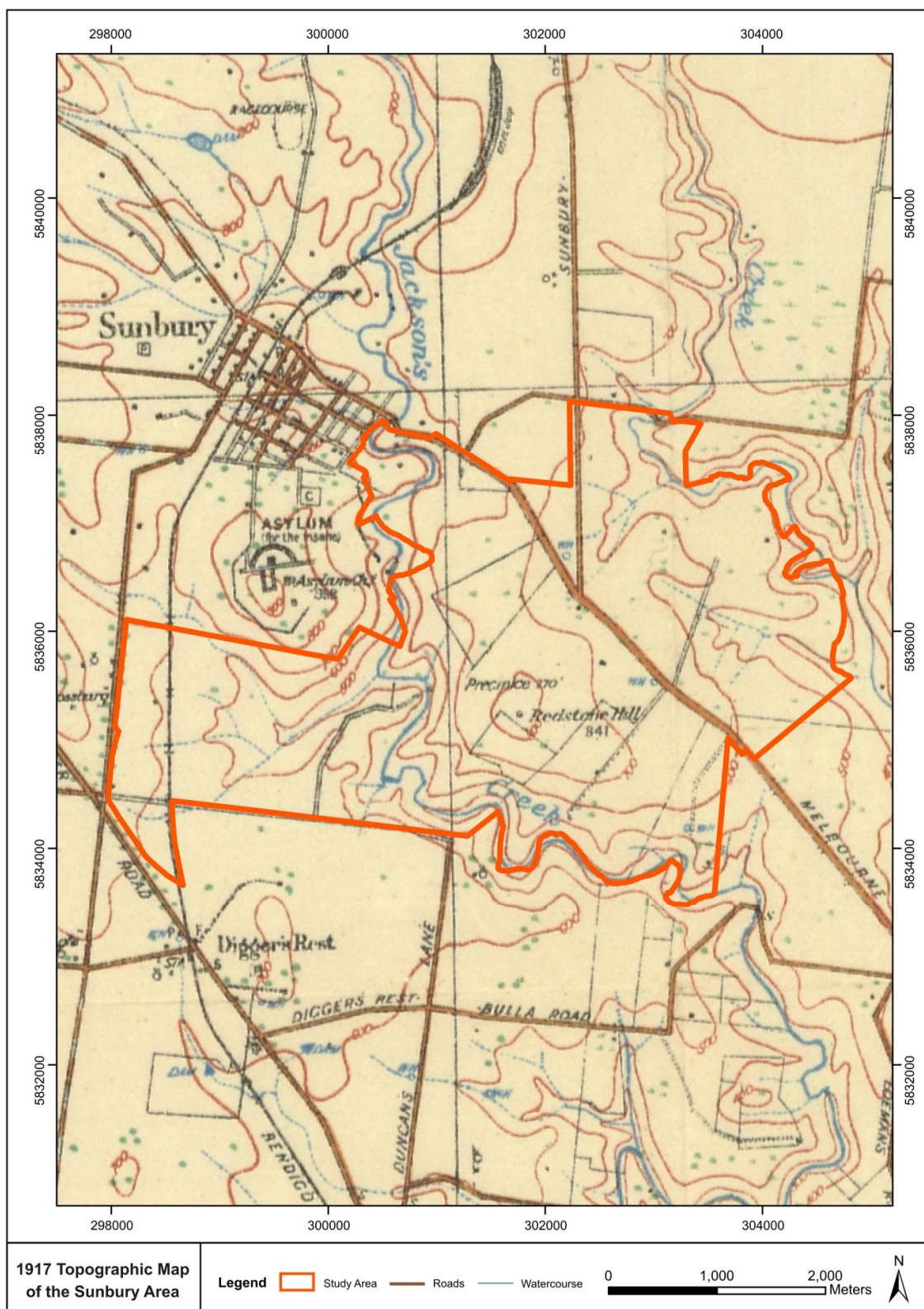


Figure 3: 1917 topographic map of the Sunbury area showing lack of vegetation and sparse settlement around Sunbury

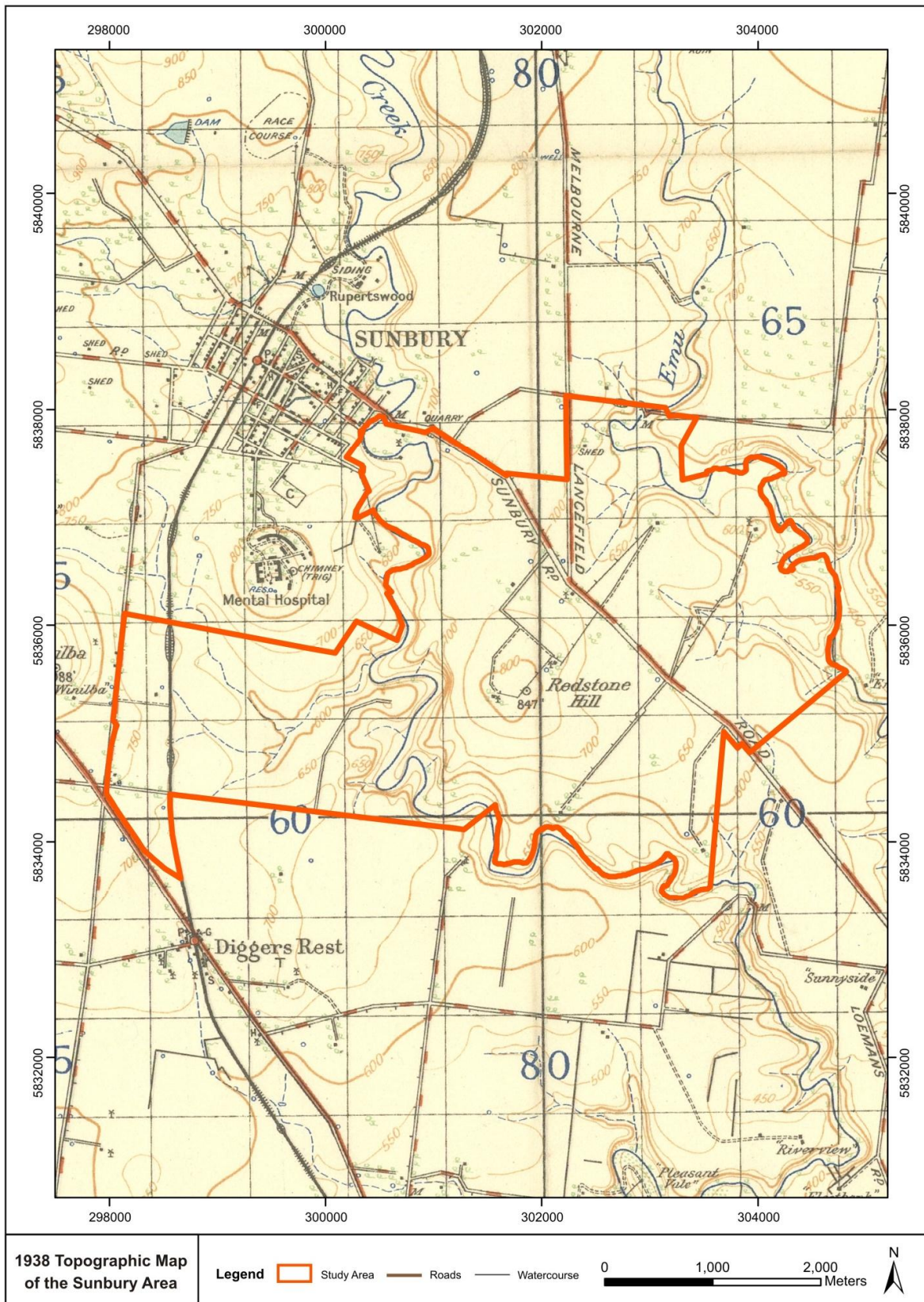


Figure 4: 1938 topographic map of the Sunbury area

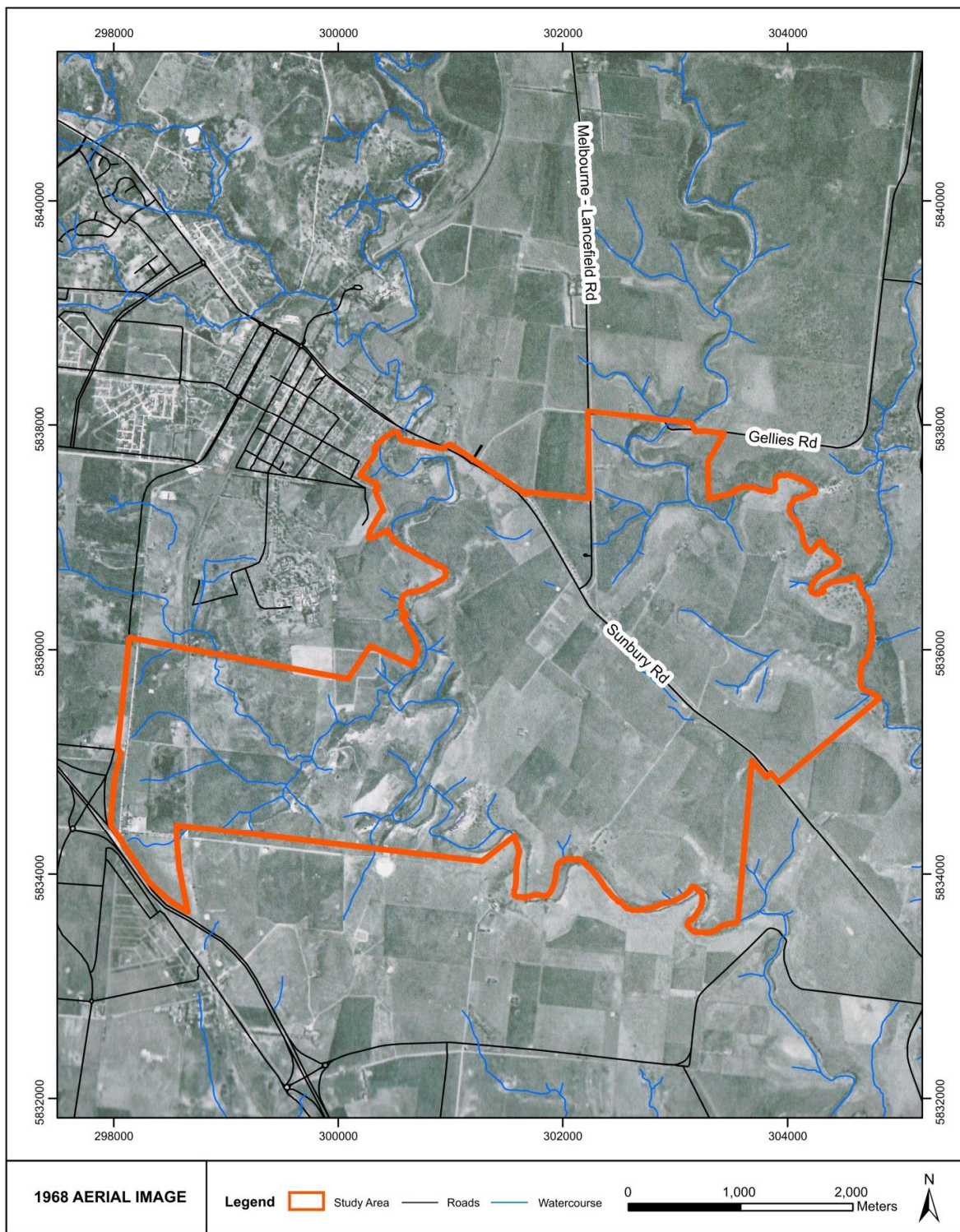


Figure 5: 1968 Aerial photograph of the study area

The study area remains predominantly rural, although it is clear when compared with the earlier topographic plans and aerial photographs that the area is now much more closely settled than it was even as late as 1968. In addition, although the area is predominantly characterised by open paddocks utilised for agricultural or pastoral purposes, it is clear other land uses are employed within the activity, such as the large quarry in the east of the Sunbury South PSP (see Map 2).

Therefore it seems that the majority of the Study area has been impacted by vegetation clearance and agricultural and pastoral activities that has included ploughing. These types of activities will have caused disturbance and dispersal of buried archaeological deposits, but not necessarily destroyed Aboriginal archaeological sites within the study area. However activities such as quarrying, substantial cutting and road construction may have resulted in the removal of soils and therefore the destruction of any Aboriginal archaeological sites that may have been present within those soils.

6.0 Review of Desktop Information and Implications for the Study Area

This Section provides an assessment of the implications of the information provided in Sections 3.0, 4.0 and 5.0 for the study area, and particularly what they mean for the likely sensitivity of certain landforms and areas within the Sunbury South PSP 1074 area. The review takes the form of a preliminary sensitivity model, which is addressed and developed further in Section 8.0 based on the results of field survey.

Firstly, large portions of the study areas have been previously surveyed. Around 500 hectares (27%) has been surveyed in the Sunbury South PSP area (although reports have not been submitted to the VAHR for all of these surveys). Much of this previous survey has focussed on the western side of the PSP area, along Jacksons Creek and the tributaries and plains surrounding it.

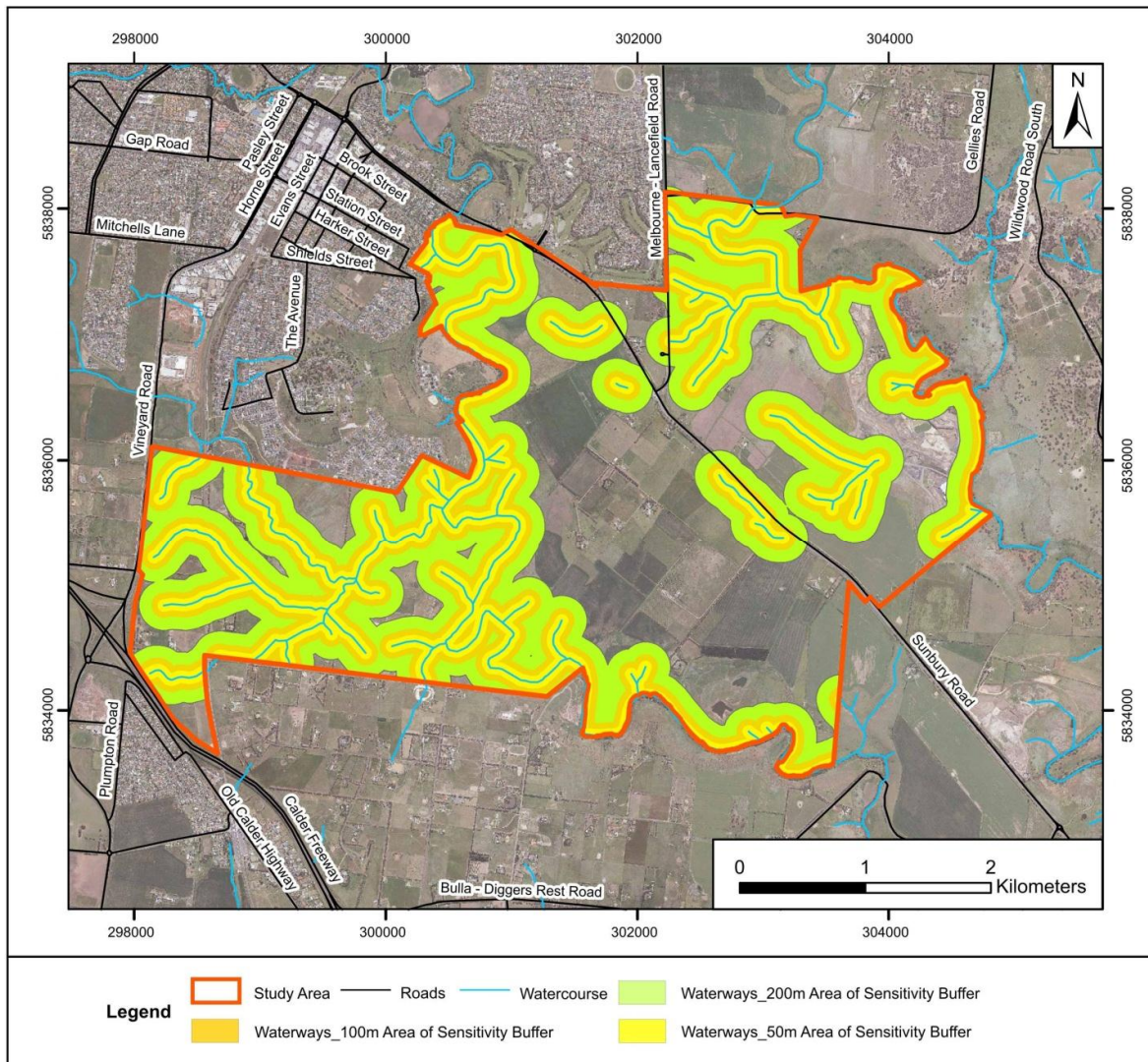
Not surprisingly, the known site locations are found in areas that have been the subject of previous archaeological survey. There are therefore landforms within this region that can be clearly stated to be of *demonstrated* high sensitivity for Aboriginal cultural heritage; namely Jacksons Creek and tributaries. Extensive archaeological survey and testing in these areas has clearly demonstrated that areas along the creek lines routinely contain Aboriginal sites, and this may be due to a combination of the numerous creek valleys which provided fresh water and shelter, and the presence of numerous silcrete quarries near Jacksons Creek and Jacksons Hill in this area. This sensitivity is also borne out at a regional level, with several areas along Jacksons Creek (both north and south of the study area) containing clusters of Aboriginal archaeological sites. The size of the sensitivity zone around these waterways (and particularly Jacksons Creek) varies, however, with predicted zones ranging from 50m to 200 metres. On the basis of a simple analysis of site location within the study area, over 92% (n = 110) of sites within the study area are within 200 metres of a waterway, and this clearly differentiates the creek corridors from other land landforms. However, further analysis shows that 25% (n = 30) of sites are found within 50 metres of a waterway and 64% (n = 77) are found within 100 metres of a waterway. This suggests that there is a much greater frequency of sites within 100 metres of waterways and a slight increase in frequency in the zone 50 to 100 metres from the waterway.

However, included within this discussion about creek corridor sensitivity zones in regional reports, there is generally recognition of the varying sensitivities of different landforms within this zone, such as the floodplain or alluvial terraces, valley slopes and top of the escarpment. There is also, however, significant variation in the way in which these landforms sensitivities are interpreted. Although the floodplain is usually seen as the most sensitive area (probably because it provided both sheltered locations in the deep valley and proximity to permanent fresh water), in several specific cases (Rhodes and du Cros 1989, Long et al 2005, Matthews et al 2006), escarpments and elevated spurs have been highlighted as sensitive, particularly when they overlook river and/or creek confluences and floodplains. Ultimately it is likely that the creek corridor sensitivity zone is fluid and driven by previous Aboriginal use of other resources or activities (such as stone sources, ceremonial sites) rather than always by specific landform situations or conditions, or specific distance from the waterway.

Emu Creek is of demonstrated sensitivity for Aboriginal sites for a short section of its course, but should be seen as an area of sensitivity for the entirety of its course through the study area. Although sites have only been found along a small section of Emu Creek, few archaeological surveys have been conducted along the creek, and the number and variety of sites found in the small section where sites have been identified suggest that Emu Creek was, like Jacksons Creek, also intensively used. Like Jacksons and Deep Creeks, it has a deep steep sided valley, and was therefore likely to have been favoured as a reliable source of fresh water that was sheltered from cool winds across the basalt plain.

The basalt plains outside these river corridors are largely an unknown quantity, as large tracts of this landform have not been surveyed within the activity area. However, where they have been surveyed, they have been found to contain few sites or low density artefact distributions. Similarly, at a regional level, the basalt plains have generally yielded very few sites or very disturbed and dispersed low density sites. It is usually argued that high

points are usually the most sensitive landforms outside creek valleys in the volcanic plains environment, as they offered locations from which to observe the surrounding countryside. This has been demonstrated in the broader region, where hills or eruption points have been shown to contain sites. On this basis, the basalt plain component of the study area is likely to yield fewer sites, with the exception of Redstone Hill. Being an elevated point, this is likely to have some potential. However, given that there are several high points nearby, most of which are higher, it may not have offered the same views as more isolated view points as She Oak Hill for example. Nevertheless, Redstone Hill should be seen as an area of sensitivity.



Map 7: 50, 100 and 200 metre sensitivity buffers around waterways within the Study Area

7.0 Field Survey

This Section details the methods and results of field survey undertaken for the project. The results section also includes a brief description of all sites identified during the survey and an assessment of the significance of each site.

7.1 Methodology

The field method aimed to strike a balance between areas that had not previously been surveyed and areas that were accessible, as well as investigation into a sample of a variety of landforms within the study area. It was identified during the desktop assessment that 27% of the Sunbury South PSP area had been previously surveyed, and the majority of this work had been conducted on the western side of the PSP area. As a result the focus became the eastern and southern side of the Sunbury South PSP area, including Jacksons Creek, Redstone Hill, the basalt plains and Emu Creek.

After making this determination, eight properties were identified that provided a sample of the key landforms in the PSP area – namely the Jacksons Creek and Emu Creek valleys (including floodplains, valley slopes and escarpment edges), the basalt plain and Redstone Hill in the Sunbury South PSP area. The respective landowners of these properties were contacted by phone, and mutually suitable dates for the fieldwork arranged.

The impact assessment survey was undertaken over six days during April and May 2014. The survey dates and participants on each day are tabulated below:

Table 5: Survey Participants

Survey Date/s	Wurundjeri Representatives	Heritage Insight Staff
April 8 & 9, 2014	Wade Garvey and Craig Terrick	Bianca Di Fazio and Samantha Brown
April 15, 2014	Tony Garvey and Craig Terrick	Bianca Di Fazio and Samantha Brown
April 16, 2014	Bob Mullins and Danielle Mullins	Matt Chamberlain and Samantha Brown
May 5, 2014	Wade Garvey	Matt Chamberlain and Samantha Brown

The field method was simply to identify areas of good visibility on each landform and to survey these in detail to locate Aboriginal cultural heritage places. At each property therefore, the survey team sought to quickly identify each landform within the property and then to move directly to areas of best ground surface visibility. Map 8 shows the actual areas surveyed.

Once at the identified survey areas the field team spread out walking anywhere from two to twenty metres apart searching for Aboriginal cultural heritage material or features. A DGPS was carried throughout the survey and key features and points of interest were marked onto an aerial photograph of the activity area.

Notes were taken on general observations of each property and survey area, including landforms, vegetation, current use, and evidence of prior ground disturbance.

When surface cultural heritage places were located during the survey the following was undertaken:

- Recording of the site location and extent by Differential GPS, as required by the Victorian Aboriginal Heritage Register;
- In the case of artefact scatters, a sample of the artefacts contained within each site was taken. This was usually at least 20 artefacts, but in the case of smaller sites as few as four artefacts were sampled. In some instances time constraints limited the amount of sampling that could be undertaken;
- A photographic record of the general location of the surface site and cultural material was taken; and
- Drawings or plans of the site in relation to landmarks within the Activity Area and prominent man-made and local features were also taken.

7.2 Results

Survey took place within eight properties during the assessment. The properties surveyed are shown in Map 8 and tabulated below:

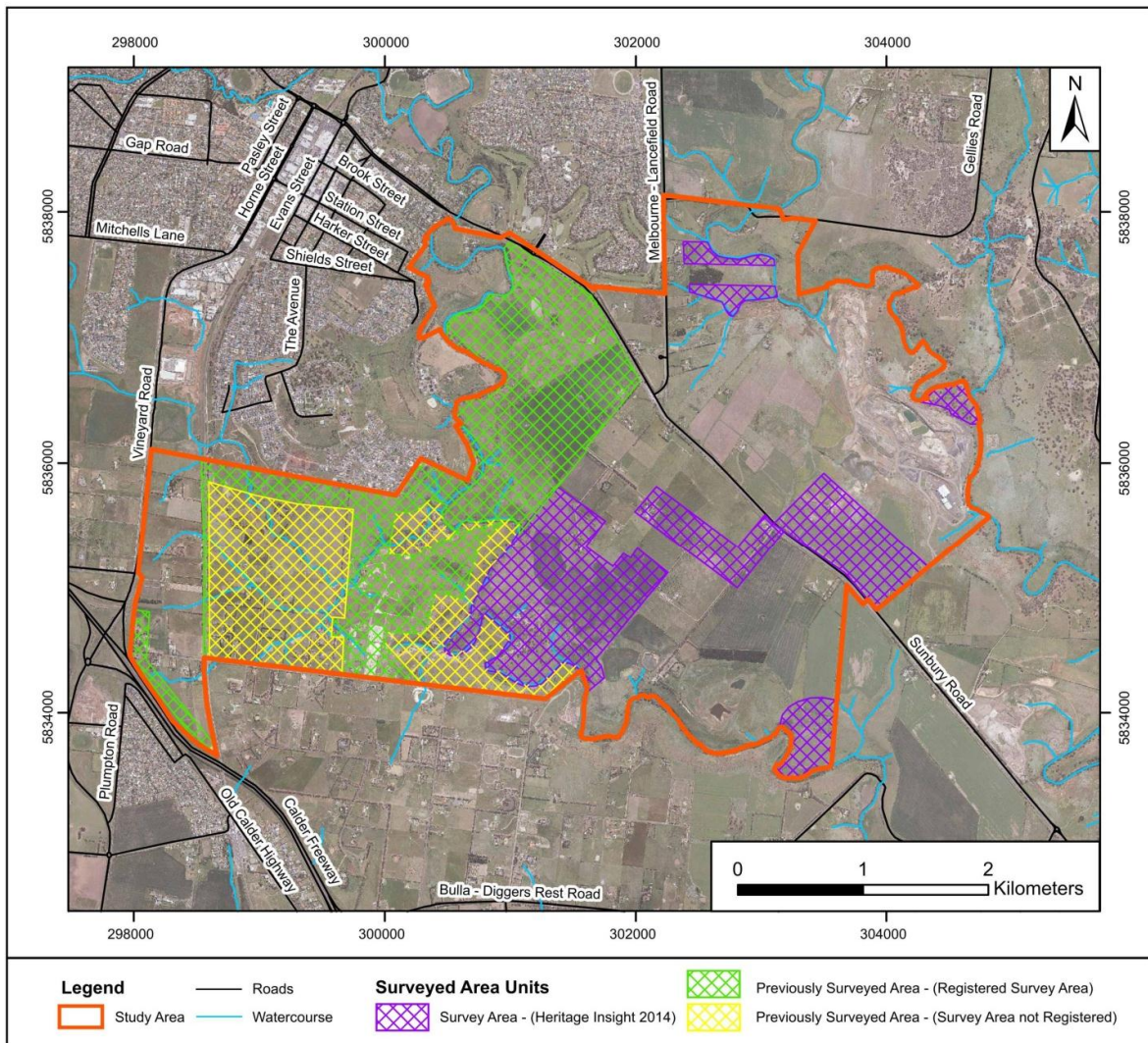
Table 6: Properties Surveyed

Property Address	Landform/s sampled
60 Lancefield Road, Bulla	Escarpment, valley slopes, escarpment, floodplain, tributary
80 Lancefield Road, Bulla	Escarpment, escarpment, floodplain, valley slopes
570 Sunbury Road, Bulla	Floodplain
600 Sunbury Road, Bulla	Volcanic Plain
605 Sunbury Road, Sunbury	Valley slopes, escarpment
40 Redstone Hill Road, Sunbury	Hill Summit, Hill slopes, floodplain, valley slopes, Escarpment
80 Redstone Hill Road, Sunbury	Hill summit, hill slopes, valley slopes, floodplain escarpment
2 Shepherds Lane, Sunbury	Volcanic Plain, Hill Slopes

Providing a fair estimate of survey coverage and defining which landforms were assessed is difficult due to the sometimes subjective nature of landform interpretation and clearly defining areas that were actually viewed by each member of the survey crew. However, it is reasonable to state that pedestrian survey coverage during the field assessment was approximately 60 hectares, with around 35 hectares (around 30 hectares on the plain and 5 hectares on the slopes of Redstone Hill) assessed on the volcanic plain and around 25 hectares in the river corridors (approximately 9 hectares on Floodplains, 8 hectares on Valley slopes, 4 hectares on the escarpment edge, and 4 hectares on smaller tributaries or ephemeral drainage lines). Because the method was to identify areas of good surface visibility, the effective coverage was consistent across all landforms. The areas surveyed are shown on Map 8.

As a general observation, it was noted that in the areas surveyed current ploughing and cropping was generally confined to areas on the volcanic plain and slopes of Redstone Hill. In a small number of cases ploughed paddocks extended into the valley, particularly in some sections of Jacksons Creek, but in most cases the steep escarpment apparently presents a boundary to ploughing. In most cases the river valleys and floodplains were either vacant, or used for grazing.

Fourteen Aboriginal cultural heritage places were identified and registered during the field assessment. These are discussed briefly below.



Map 8: Areas surveyed during field assessment (also shows previous surveys).

7.3 Summary of sites identified and review of preliminary sensitivity model

In Summary, the sites identified during the field assessment and their landform situation and distance to the nearest waterway are as follows:

Table 7: Summary of sites found during field survey

Site Name and Number	Site Type	Landform	Distance to nearest waterway
Redstone Hill 1 (VAHR 7822-3784)	Large artefact scatter	Valley slope and Floodplain	25 metres
Redstone Hill 2 (VAHR 7822-3785)	Isolated artefact	Floodplain	40 metres
Redstone Hill 3 (VAHR 7822-3786)	Large artefact scatter	Valley slope	70 metres
Redstone Hill 4 (VAHR 7822-3787)	Isolated artefact	Floodplain	30 metres
Redstone Hill 5 (VAHR 7822-3788)	Small low-density artefact scatter	Escarpment edge	80 metres
Redstone Hill 6 (VAHR 7822-3789)	Isolated artefact	Volcanic hill summit	500 metres
Redstone Hill 7 (VAHR 7822-3790)	Small low density artefact scatter	Escarpment edge	180 metres
Redstone Hill 8 (VAHR 7822-3794)	Isolated artefact	Volcanic Plain	500 metres
Jacksons Creek 6 (VAHR 7822-3791)	Small artefact scatter	Valley slope	50 metres
Jacksons Creek 7 (VAHR 7822-3792)	Isolated artefact	Valley slope	50 metres
Jacksons Creek 8 (VAHR 7822-3793)	Isolated artefact	Escarpment edge	200 metres
Emu Creek 2 (VAHR 7822-3779)	Large artefact scatter	Valley slope and Floodplain	20 metres
Emu Creek 3 (VAHR 7822-3780)	Artefact deposit in cutting	Valley slope	40 metres
Emu Creek 4 (VAHR 7822-3781)	Large artefact scatter	Floodplain	15 metres

Five of the sites are located in whole or in part on Floodplain, six on River valley slopes, three on the escarpment edge, one on the volcanic plain and one on the summit of Redstone Hill.

The results support the predictions made in the preliminary sensitivity model at the conclusion of the desktop assessment, except with respect to Redstone Hill:

- The sensitivity of the Jacksons Creek valley has been confirmed, with sites identified varying from isolated artefacts to small low-density artefact scatters, small artefact scatters and large artefact scatters;
- The sensitivity of the Emu Creek Valley is confirmed, with four sites located, ranging from an artefact deposit exposed in a cutting, to two large and very dense artefact scatters;
- The prediction of fewer sites on the basalt plain has been confirmed. Despite extensive survey of this landform only one site was identified.
- The identified potentially higher sensitivity of Redstone Hill was not confirmed. Although the summit and slopes of Redstone Hill were extensively surveyed, only one site was identified.
- 12 of the 14 sites (85%) of the sites were found within 200 metres of a waterway, and 10 of these (71%) were within 100 metres.

- No sites were identified adjacent to the tributaries that were surveyed.

Significance assessment

The significance of the Aboriginal archaeological sites located during this assessment have been assessed against the Australia ICOMOS Burra Charter Criteria for the assessment of cultural significance (Australia ICOMOS 1999).

The Burra Charter defines Cultural Significance as “...aesthetic, historic, scientific, social or spiritual value for past, present or future generations” (Australia ICOMOS 1999, 12). Cultural significance is embodied in the place itself, its fabric, setting, use, associations, meanings, records, related places and related objects. Therefore, a place may have a range of meanings for individuals or groups.

Aesthetic value is defined as the “...aspects of sensory perception for which criteria can and should be stated. Such criteria may include consideration of the form, scale, colour, texture and material of the fabric; the smells and sounds associated with the place and its use” (Australia ICOMOS 1999, 12).

Historic value is defined as the history of aesthetics, science and society. According to the Burra Charter, “A place may have historic value because it has influenced, or has been influenced by, an historic figure, event, phase or activity. It may also have historic value as the site of an important event. For any given place the significance will be greater where evidence of the association or event survives *in situ*, or where the settings are substantially intact, than where it has been changed or evidence does not survive. In some cases however, events or associations may be so important that the place retains its significance regardless of subsequent treatment” (Australia ICOMOS 1999, 12).

Scientific value is defined as relying upon “...the importance of the data involved, on its rarity, quality or representativeness, and on the degree to which the place may contribute further substantial information” (Australia ICOMOS 1999, 12). Scientific significance is assessed by examining the research potential and representativeness of archaeological sites.

The scientific significance assessment methodology outlined below is based on scores for research potential (divided into site contents and site condition) and for representativeness. This system is refined and derived from Bowdler (1981), and Bowdler and Sullivan (1984).

Research potential is assessed by examining site contents and site condition.

‘Site contents’ refers to all cultural materials and organic remains associated with human activity at a site. ‘Site contents’ also refers to the site structure - the size of the site, the patterning of cultural materials within the site, the presence of any stratified deposits and the rarity of particular artefact types.

‘Site condition’ refers to the degree of disturbance to the contents of a site at the time it was recorded.

The ‘site contents’ ratings used for the Aboriginal Places described in this report are:

0. No cultural material remaining
1. Site contains a small number (e.g. 0–10 artefacts) or limited range of cultural materials with no evident stratification
2. Site contains:
 - (a) a larger number, but limited range of cultural materials; and/or
 - (b) some intact stratified deposit remains; and/or

- (c) rare or unusual example(s) of a particular artefact type
- 3. Site contains:
 - (a) a large number and diverse range of cultural materials; and/or
 - (b) largely intact stratified deposit; and/or
 - (c) surface spatial patterning of cultural materials that still reflect the way in which the cultural materials were deposited

The site condition ratings for the Aboriginal Places described in this report are:

- 0. Site destroyed
- 1. Site in a deteriorated condition with a high degree of disturbance; some cultural materials remaining
- 2. Site in a fair to good condition, but with some disturbance
- 3. Site in an excellent condition with little or no disturbance. For surface artifact scatters this may mean that the spatial patterning of cultural materials still reflects the way in which the cultural materials were laid down.

Representativeness refers to the regional distribution of a particular site type.

Representativeness is assessed by whether the site is common, occasional, or rare in a given region. Assessments of representativeness are subjectively biased by current knowledge of the distribution and number of archaeological sites in a region. This varies from place to place depending on the extent of archaeological research. Consequently, a site that is assigned low significance values for contents and condition but a high significance value for representativeness can only be regarded as significant in terms of knowledge of the regional archaeology. Any such site should be subject to re-assessment as more archaeological research is undertaken.

Assessment of representativeness also takes into account the contents and condition of a site. For example, in any region there may only be a limited number of sites of any type that have suffered minimal disturbance. Such sites would therefore be given a high significance rating for representativeness, although they may occur commonly within the region.

The representativeness ratings used for the archaeological site described in this report are:

- 1. common occurrence
- 2. occasional occurrence
- 3. rare occurrence

Overall scientific significance ratings for sites, based on a cumulative score for site contents, site integrity and representativeness are:

- 1 - 3 low scientific significance
- 4 - 6 moderate scientific significance
- 7 - 9 high scientific significance

Social value is defined as “...the qualities for which a place has become a focus of spiritual, political, national or other cultural sentiment to a majority or minority group” (Australia ICOMOS 1999, 12).

The Burra Charter states that “...cultural significance may change as a result of the continuing history of the place. Understanding of cultural significance may change as a result of new information” (Australia ICOMOS 1999, 2).

Although the Burra Charter is more applicable to non-Indigenous sites and structures, it may be adapted to assess Aboriginal heritage significance. In particular, the views of contemporary Aboriginal people must be taken into consideration when assessing all of the values described above.

Table 8: Significance assessments for sites found during the field survey

Site Name and Number	Site Contents	Site Condition	Representativeness	Overall Archaeological Significance
Redstone 1 VAHR 7822-3784	2	1	1	4 (moderate)
Redstone 2 VAHR 7822-3785	1	1	1	3 (low)
Redstone 3 VAHR 7822-3786	2	1	1	4 (moderate)
Redstone 4 VAHR 7822-3787	1	1	1	3 (low)
Redstone 5 VAHR 7822-3788	1	1	1	3 (low)
Redstone 6 VAHR 7822-3789	1	1	1	3 (low)
Redstone 7 VAHR 7822-3790	2	1	1	4 (moderate)
Redstone 8 VAHR 7822-3794	1	1	1	3 (low)
Jacksons Creek 6 VAHR 7822-3791	2	2	1	5 (moderate)
Jacksons Creek 7 VAHR 7822-3792	1	1	1	3 (low)
Jacksons Creek 8 VAHR 7822-3793	1	1	1	3 (low)
Emu Creek 2 VAHR 7822-3779	2	2	1	5 (Moderate)
Emu Creek 3 VAHR 7822-3780	2	2	1	5 (Moderate)
Emu Creek 4 VAHR 7822-3781	2	2	1	5 (Moderate)

8.0 Aboriginal Heritage Site Prediction Model – Sensitivity Mapping

8.1 Sensitivity and Site Prediction Model

It should be noted at the outset of this section that the work undertaken for this investigation does not constitute a desktop or standard assessment for any future Cultural Heritage Management Plans conducted within the Sunbury South PSP area. The investigation has included very broad assessments of historic land-use over the whole of the PSP area, and has not focussed on specific properties. Similarly the surveys undertaken aimed to gain further understanding of the archaeological sensitivity of landforms within the PSP area, and therefore did not focus specifically on properties, but landforms. The sensitivity zones and site prediction model below is constructed with this in mind.

At a statewide level, the *Aboriginal Heritage Regulations 2007* assign a layer of cultural heritage sensitivity to named waterways and to registered Aboriginal heritage places. In the case of named waterways, this layer extends 200 metres either side of each named waterway, while for the registered sites the layer extends 50 metres from the boundary of the Place.

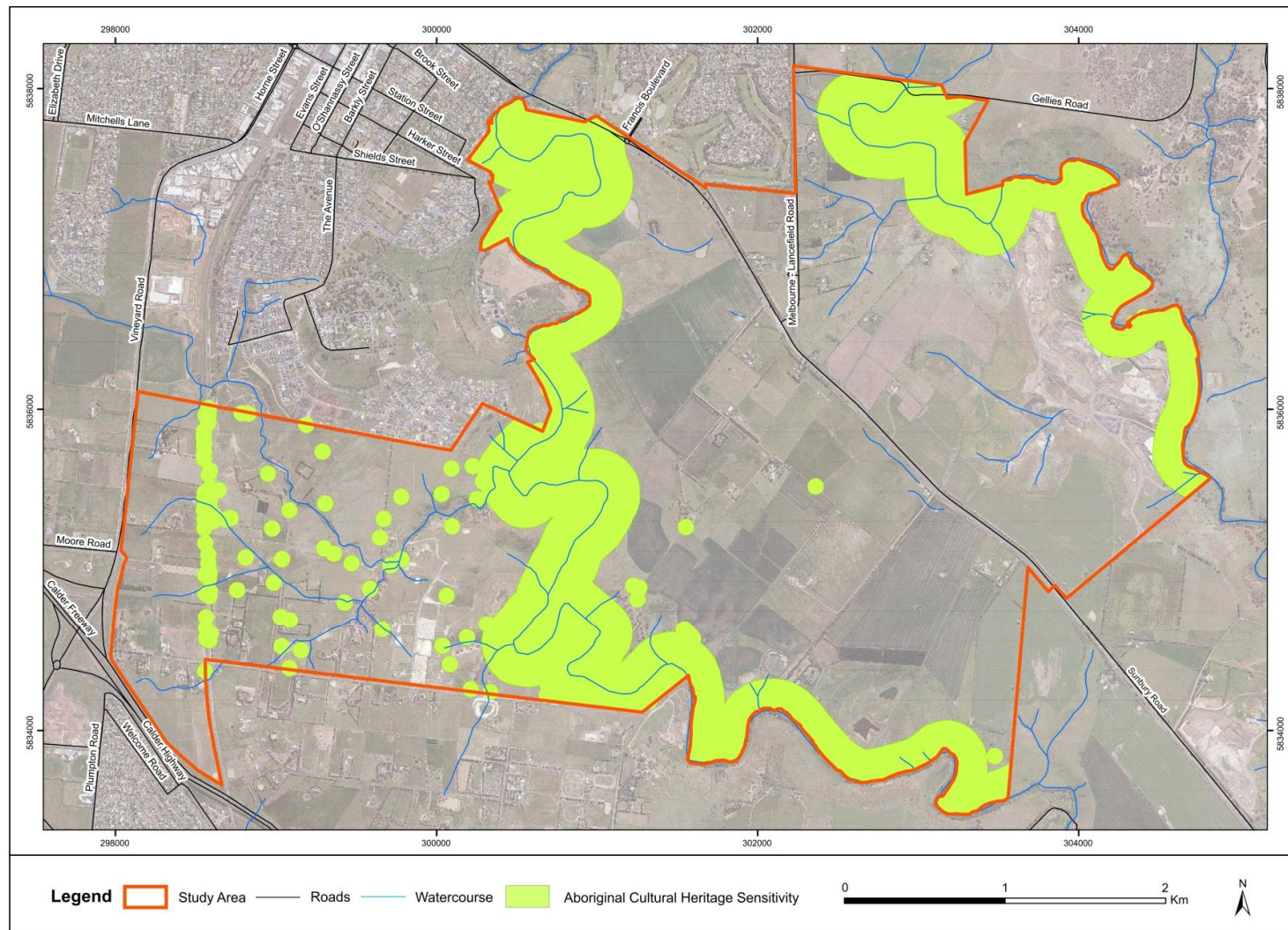
In the desktop component of this report, known site locations in the PSP area were assessed with reference to their proximity to waterways. In this case, however, all waterways (not just named waterways) were included and this assessment showed that 92% of the known sites in the Sunbury PSP area were within 200 metres of a waterway. In addition, 85% of the sites found during the field component of this project were located within 200 metres of a waterway. These figures demonstrate that for the Sunbury area, the general principle of cultural heritage sensitivity within 200 metres of a waterway is very sound.

Proximity of sites found during the survey to previously recorded sites is not directly assessed here, largely because in most cases the survey areas were not near previously recorded site locations. However, given that in the case of sites that have not been thoroughly investigated it is reasonable to expect that additional cultural heritage material could be located nearby a known or visible site, the principle of a 50 metre buffer of cultural heritage sensitivity is also sound.

Map 9 shows cultural heritage sensitivity based on the principles of the *Aboriginal Heritage Regulations 2007* in relation to waterways and previously recorded Aboriginal heritage places. These do not make reference to any hierarchical structure for sensitivity, but rather define the highlighted areas as ‘sensitive’, with areas outside the highlighted zones assumed to be not sensitive.

The results of desktop analysis and the results of the field survey however, indicate that the cultural heritage sensitivity of the Sunbury South PSP area can be tiered, and Map 10 shows sensitivity zones listed as High, Moderate and Low sensitivity. On the basis of the sheer number of sites found within 200 metres of waterways in the PSP area, zones within 200 metres of the waterways are considered to be of high sensitivity for Aboriginal cultural heritage.

Further to this, there are additional areas of high sensitivity applicable to some large areas along Jacksons and Emu Creeks, and the tributaries of Jacksons Creek in the southwest of the Sunbury South PSP area, because the concept of a simple distance from the waterway is not necessarily adequate to cover the sensitive zones in every case. As the field results demonstrate, sites were found in all landforms within the river valleys, including floodplains, terraces, valley slopes or spurs, and the edge of the escarpment, which in some cases is further than 200 metres from any waterway. For this reason it is appropriate to include the creek valleys in their entirety, even if that is further than 200 metres from the watercourse, as areas of high sensitivity. This includes all areas extending from the waterway to 50 metres beyond the escarpment edge. Employing this interpretation also includes the sections of the tributaries of Emu Creek that have been proven to be more sensitive for Aboriginal sites.



Map 9: Showing sensitivity within the study area based on the principles of the *Aboriginal Heritage Regulations 2007*

The vast majority of the registered sites within the PSP area are located within this high sensitivity zone, and as discussed in the desktop assessment, this may be because the deep river valleys provided shelter, water, and a greater variety of resources including stone tool raw material sources. There is some variety in the size and condition of the sites identified in different areas. At Emu Creek, for example, the sites found included larger and apparently less disturbed sites (including sites with visible stratified deposits) than those found during the survey on Jacksons Creek. However, this is offset by the fact that, as far as is currently known, the Jacksons Creek valley contains a greater variety of sites including ceremonial sites, raw material sources, artefact scatters and scarred trees.

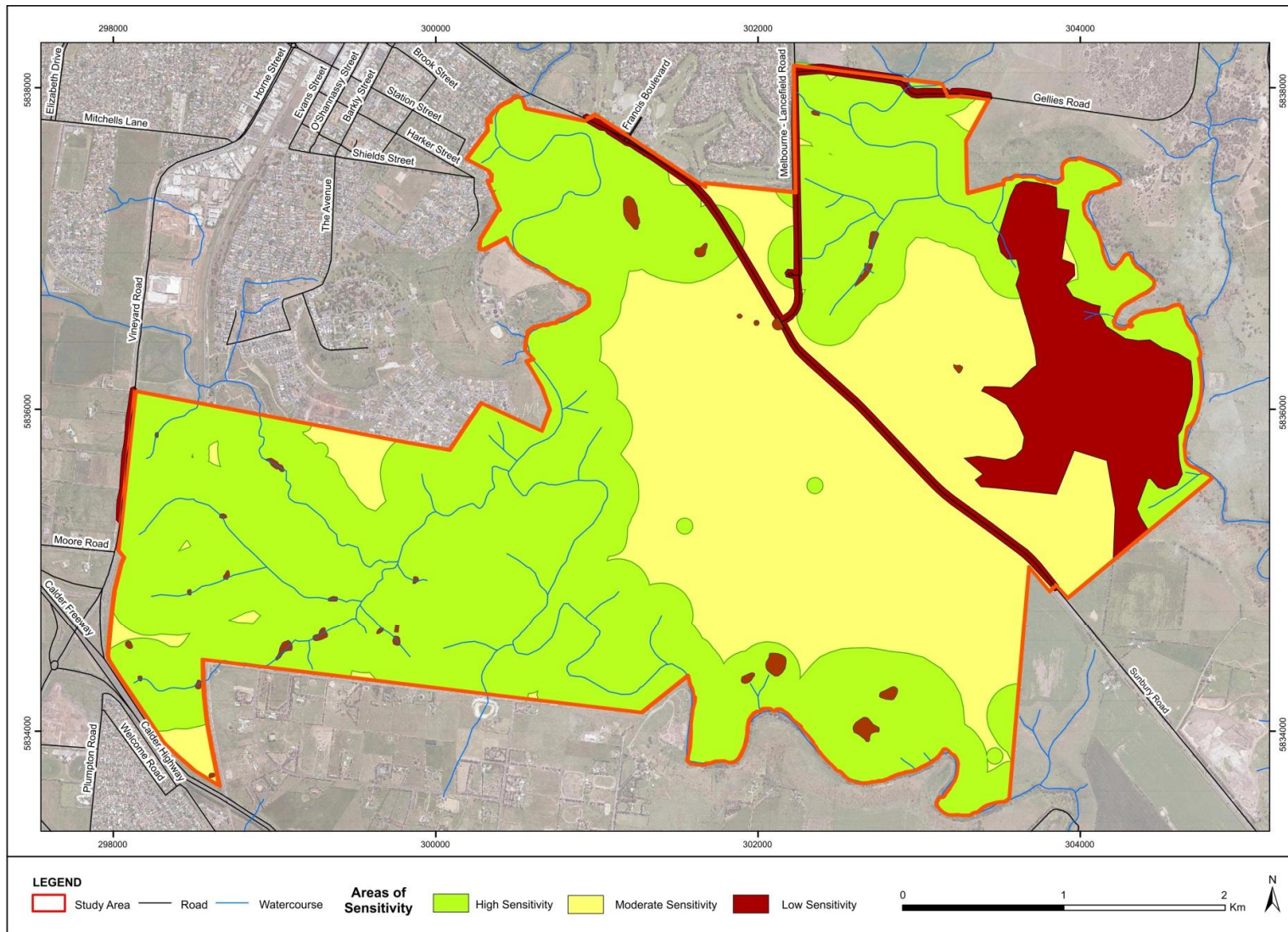
Ultimately the high sensitivity zone contains a high concentration of sites of a variety of types, and is likely to contain additional sites of similar variety, density and concentration. With regard to disturbance in this zone, based on observations made during the survey and visual interpretation of aerial photographs, this zone appears to contain large areas of apparently less disturbed landforms, as well as remnant features such as dry oxbow lakes and prior watercourses.

The vast majority of the remainder of the PSP area is considered to be of moderate sensitivity for Aboriginal cultural heritage. In the western portion of the Sunbury South PSP area, which has been relatively intensively surveyed, a number of sites are found outside the zone of high sensitivity identified above. However, these are usually smaller and/or lower density sites than those found along the waterway corridors.

This moderate level of sensitivity can be extended to the basalt plains on the eastern side of the PSP area. As was noted in the desktop assessment, the basalt plains area is generally considered to be of lower sensitivity regionally, but is largely an unknown quantity within the PSP area. The archaeological assessments that have been conducted on the basalt plains (including the current assessment) have been limited to surface survey, with the associated problems of surface visibility and accessibility. The lack of detailed archaeological assessment that includes sub-surface testing, means that the picture of site distribution and the true extent of the known sites on the eastern side of the PSP area is far from complete. Nevertheless, while fewer sites have been found through this area, the simple fact that they were found during this assessment suggests a reasonable likelihood of sites loosely scattered across the basalt plains.

Moderate sensitivity in this case is therefore considered to represent areas where archaeological sites are more likely to be found in lower concentrations and include a more limited range of sites and smaller or lower-density sites, with the occasional larger or medium density site. The distribution of these sites is likely to be driven by considerations which may or may not be currently visible, such as the presence of smaller water sources such as springs, vegetation or plant resources, stone sources, or good vantage points. Based on observations made during the survey and evidence of landform disturbance in aerial photographs, sites in this zone are more likely to be disturbed.

Areas of low archaeological sensitivity are confined to areas that are either known to have been disturbed, such as quarries, dams and a railway cutting, or areas that are usually subject to a variety of disturbances such as road reserves where disturbances such as drainage and services, as well as road pavements, have occurred. However, rather than assuming that these areas have no sensitivity, in these areas it is considered that sites will occur in very low concentrations, be generally smaller or low in density, and very likely to have been disturbed.



Map 10: Showing Sensitivity zones as defined during this investigation

9.0 Future Management

This report has aimed to define areas of sensitivity for Aboriginal cultural heritage within the Sunbury South PSP 1074 area. The areas of sensitivity are shown in Map 10 and the rationale for them has been discussed in the preceding pages, and the following future management discussion focusses on them, as well as the requirements of the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007*. It has been highlighted within the report, and it is reiterated here, that that the work undertaken for this investigation does not constitute a desktop or standard assessment for any future Cultural Heritage Management Plans that may be conducted within the Sunbury South PSP area. As a result, any future Cultural Heritage Management Plans required by the *Aboriginal Heritage Act 2006* and *Aboriginal Heritage Regulations 2007* within the PSP area must complete the full range of assessment required by the Regulations.

The Act and Regulations require that certain activities (defined within the Regulations as ‘High Impact’ activities) that are proposed in areas of Cultural Heritage Sensitivity (also defined within the Regulations – See Map 11) require the preparation of a Cultural Heritage Management Plan prior to commencement, as part of the planning process. For example, ‘Subdivision of land’ is a listed high impact activity (Regulation 46), while areas within 200 metres of named waterways and areas within 50 metres of registered cultural heritage places (among others) are areas of cultural heritage sensitivity (Regulations 23 and 22 respectively). The content and structure of a Cultural Heritage Management Plan is defined by the Regulations and formal Guidelines, and requires several stages of assessment; including Desktop, Standard (Survey) and Complex (archaeological testing) assessments. CHMPs also require detailed consultation with Registered Aboriginal Parties (RAPs) and/or Aboriginal community organisations. The RAP for the Sunbury area is the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc.

Ultimately, future urban development within the Sunbury South 1074 PSP area will be guided by the requirements of the Act and Regulations, and the following recommendations address these requirements in the context of the sensitivity zones defined in this report, which are:

High Sensitivity

The zone of high sensitivity defined in this report is known to contain a high concentration of, and is likely to contain additional, sites of a variety of types including ceremonial sites, high-density artefact scatters, scarred trees and quarries. These sites are likely to be larger, more intact and of greater scientific and cultural significance. These factors could have an impact on future urban development within the zone. As a result, recommendations are required that aim to manage the archaeological and cultural sensitivity of the area in terms of the legislative requirements for future developments and in terms of guiding the broader scale of development, including protection of some areas.

Moderate sensitivity

This zone is known to contain a small number of sites, limited to small low density artefact scatters or low density artefact distributions. It is likely to contain additional sites of a limited range in low concentrations. These sites are likely to be lower in density and more likely to be disturbed. This is not likely to have an impact on future urban development within this zone. Nevertheless, recommendations are required that aim to manage the area in terms of legislative requirements for future developments.

Low sensitivity:

This zone does not contain any known Aboriginal sites, but is likely to contain sites of a limited range in sparse concentrations. These sites are likely to be low in density and are more likely to be disturbed. This is not likely to have an impact on future urban development within this zone. Nevertheless, recommendations are required that aim to manage the area in terms of legislative requirements for future developments.

Recommendations

Recommendation 1 – All Zones – Future CHMP requirements

- Irrespective of the area of sensitivity (defined in this report) in which it falls, the necessity for the preparation of a Cultural Heritage Management Plan (CHMP) for any activity will be defined by the requirements of the *Aboriginal Heritage Act* 2006 and *Aboriginal Heritage Regulations* 2007. Map 11 shows all the allotments that currently fall within Areas of Cultural Heritage Sensitivity as defined by the *Aboriginal Heritage Regulations* 2007 and would therefore require a mandatory CHMP for any High Impact Activities. It should be noted however that Aboriginal cultural heritage sensitivity maps are revised frequently and should be checked in future to confirm sensitivity areas. A summary list of High Impact Activities is included in Appendix 1. Where any listed high impact activity is proposed within any allotment that falls within or partly within an area of cultural heritage sensitivity, a mandatory Cultural Heritage Management Plan will be triggered. All future CHMPs must include consultation with the Registered Aboriginal Party for the Sunbury area – the Wurundjeri Tribe Land and Compensation Cultural Heritage Council Inc, and information from the Wurundjeri Cultural Values Report for the Sunbury area should be incorporated into any future CHMP within the Sunbury South PSP area.

Recommendation 2 – All Zones - Residential developments, future CHMPs, open space

- Given the nature of archaeological potential in all zones and particularly the high sensitivity zone, and the requirements of Section 61 of the *Aboriginal Heritage Act* 2006 to avoid and minimise harm to Aboriginal cultural heritage, future urban developments within the PSP area should maintain a level of flexibility in planning to allow for the allocation of open space for the protection of significant Aboriginal cultural heritage places in the context of future Cultural Heritage Management Plans.

Recommendation 3 – Aboriginal Cultural Heritage Area 1 – Jacksons Creek and Emu Creek

- The results of this assessment have demonstrated that around two thirds of the known sites within the PSP area are located within 100 metres of a waterway, and large numbers and the greatest variety of sites are found within the Jacksons Creek and Emu Creek corridors – all within the areas of high sensitivity defined in this report. Urban development within these areas should therefore be limited. Substantial areas along Jacksons and Emu Creeks that extend up to and beyond 100 metres from each waterway have been designated as strategically important areas for the protection of Growling Grass Frog habitat, and these areas should also be designated as Aboriginal cultural heritage areas (see Map 12). It is understood that these areas will or may be publicly accessible, but any development required to enable public access remains subject to CHMP requirements set out by the *Aboriginal Heritage Act* 2006 and *Aboriginal Heritage Regulations* 2007, and to the guidelines outlined below in Recommendation 4.

Recommendation 4 – Guidelines for future management of Aboriginal Cultural Heritage Areas

- The following guidelines for future management of Aboriginal cultural heritage areas as outlined in Recommendation 3 and 4 should be adopted:
 - Consultation with the Registered Aboriginal Party – the Wurundjeri Council – should be undertaken in relation to any proposed works with regard to both heritage requirements and cultural matters;
 - High impact activities as defined in the *Aboriginal Heritage Regulations* 2007 (and listed in Appendix 1) should be avoided;
 - Works related to the maintenance and enhancement of natural values should be promoted; and
 - Cultural heritage interpretation should be incorporated where possible and appropriate. Any cultural heritage interpretation should be developed in consultation with the Wurundjeri Council.
 - The areas could also be used as locations for repatriation of artefacts recovered during CHMP assessments and salvage works conducted within the PSP area in future.

Recommendation 5 – High Sensitivity Zones outside Aboriginal Cultural Heritage Areas 1 and 2 – Future CHMP Complex Assessments

- Given the high archaeological potential within the zone of high sensitivity, the likelihood of uncovering subsurface archaeological deposits is also high. As a result, it is extremely likely that all CHMPs within the high sensitivity zones will proceed to complex assessment. Complex assessments in high sensitivity zones in future Cultural Heritage Management Plans within the PSP area should include an intensive subsurface testing program employing a methodology developed in consultation with the Registered Aboriginal Party – the Wurundjeri Tribe Land and Consultation Cultural Heritage Council Inc.

Recommendation 6 – VAHR Sites

- Any proposed works to any of the VAHR sites within the PSP area, including proposed protective or stabilising works to sites within Aboriginal Cultural Heritage Areas, must be conducted in line with an approved Cultural Heritage Management Plan or Cultural Heritage Permit, and include detailed consultation with the Registered Aboriginal Party – the Wurundjeri Council. Under sections 27, 28 and 29 of the *Aboriginal Heritage Act* 2006 it is unlawful to harm or do an act likely to harm Aboriginal cultural heritage, unless it is in accordance with a Cultural Heritage Permit or approved CHMP.

Recommendation 7 – Proposed Bridge Crossings

- A bridge crossing of Jacksons Creek are proposed within the Sunbury South PSP 1074 area, with five alignment options presented at this stage. As these crossings will pass through zones of high sensitivity, the primary aim should be to select the alignment which utilises previously disturbed ground, although the length of the option and other factors such as number of known sites along the option should also be considered.

Option A passes through ploughed paddocks and apparently less disturbed valley slopes on the east side of Jacksons Creek and into rural land and an existing road reserve along the edge of the escarpment on the western side. Nearby sites include a Low Density Artefact Distribution and artefact scatters.

Option B passes through ploughed paddocks and apparently less disturbed valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes rural land on the western side. Nearby sites include a Low Density Artefact Distribution and artefact scatters and a quarry.

Option C passes through apparently less disturbed valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes rural land on the western side. Nearby sites include quarries and artefact scatters.

Option D passes through an apparently less disturbed gully and valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes rural land on the western side. Nearby sites include artefact scatters.

Option E passes through valley slopes on the east side of Jacksons Creek and into apparently less disturbed valley slopes and rural land on the western side. Nearby sites include artefact scatters.

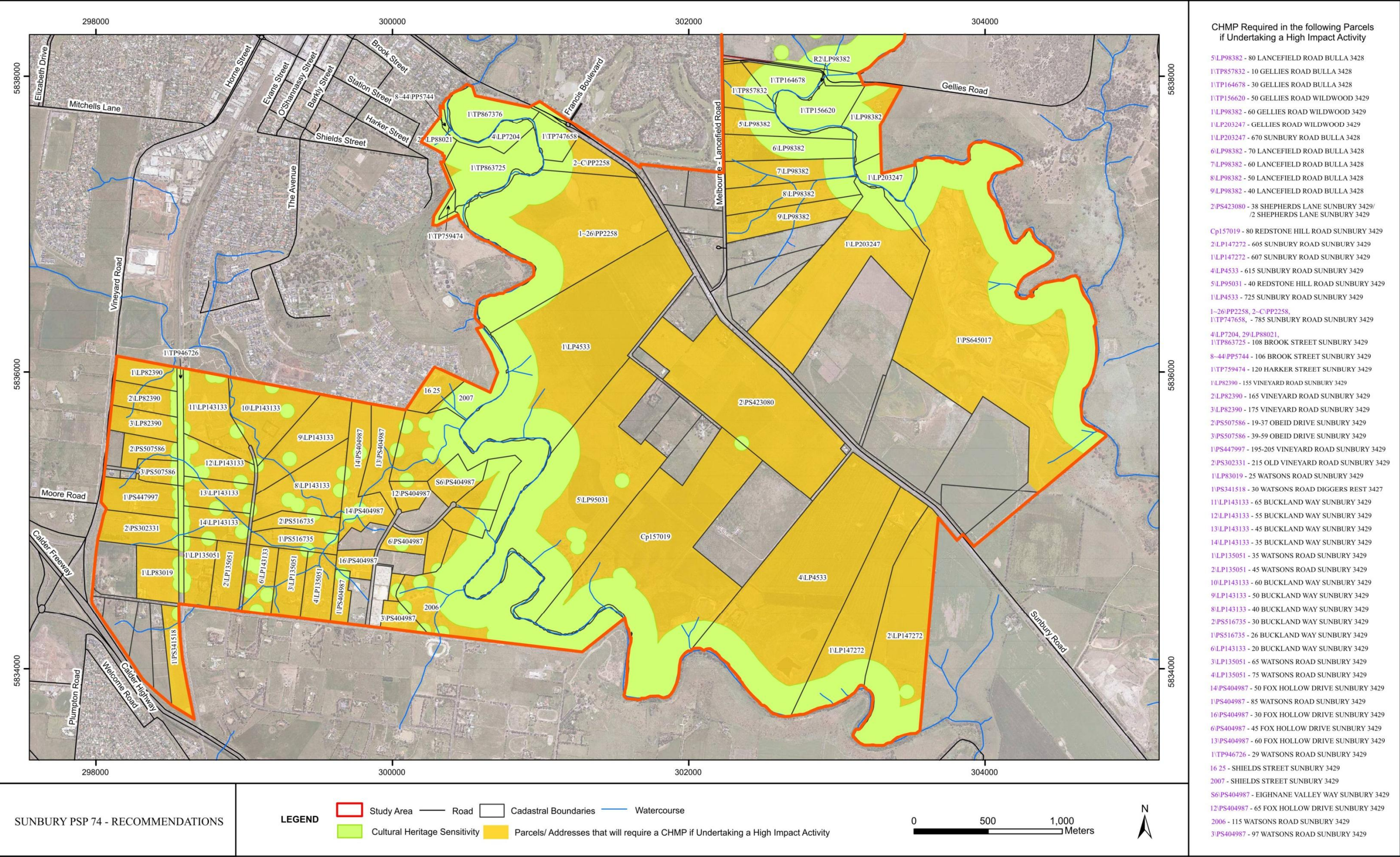
On the basis of aerial photography, none of the South Options appear particularly more suitable in terms of disturbance.

It should be noted, however, that none of these alignment options was specifically surveyed during this assessment as these locations had not yet been provided, and any final decision on the preferred

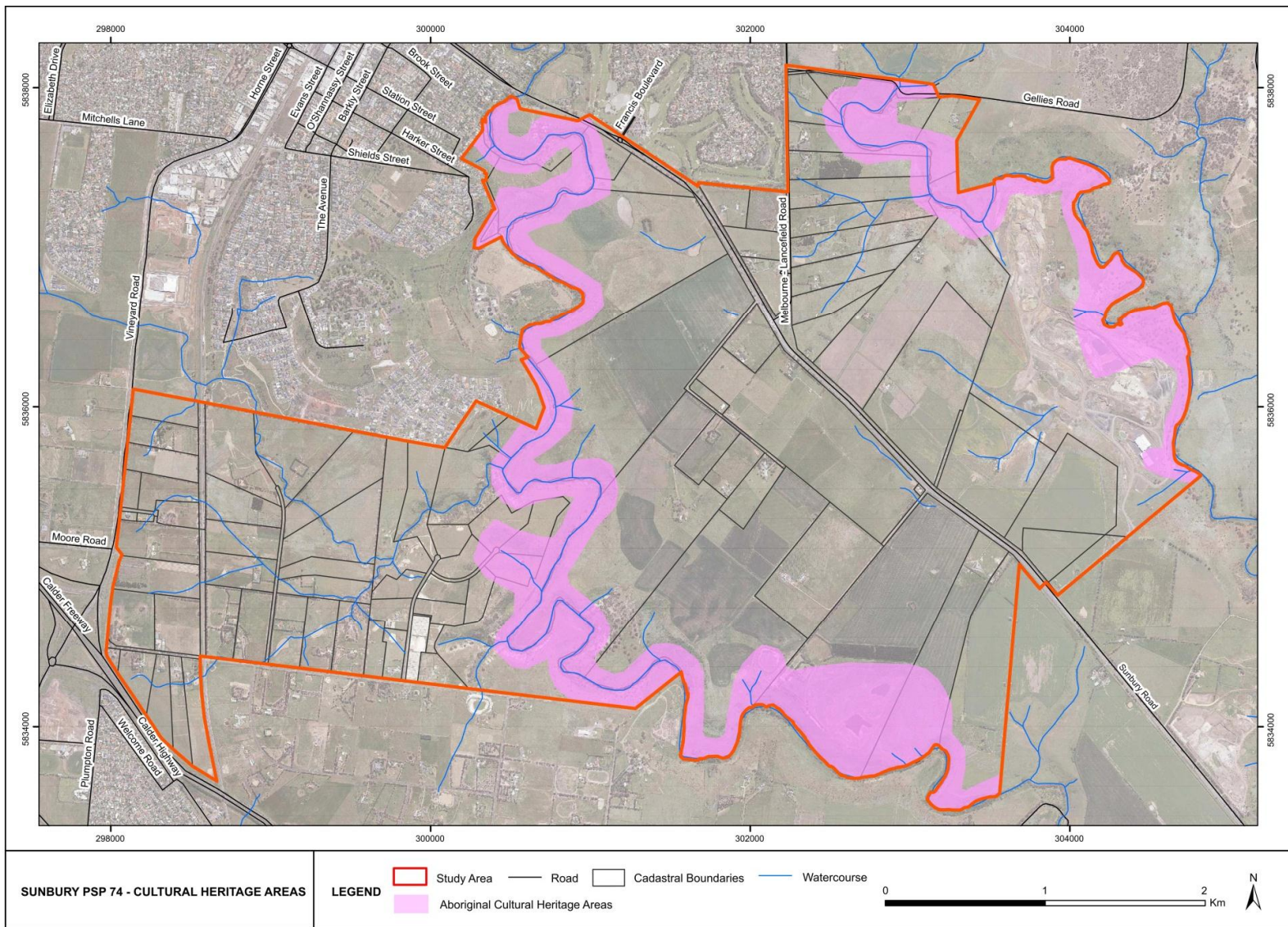
alignment should be made in conjunction with the Registered Aboriginal Party – the Wurundjeri Council.

Recommendation 9 – process for ongoing consultation

- Ongoing consultation should be held with Registered Aboriginal Party – the Wurundjeri Council – throughout the development of the PSP, to discuss the progress of planning and development and the implementation of these recommendations. This consultation should take the form of regular updates and meetings attended by a representative of MPA and Wurundjeri elders.



Map 11: Allotments where CHMP would be required in the case of a high impact activity, and areas of Cultural Heritage Sensitivity as defined in the *Aboriginal Heritage Regulations 2007*: Sunbury South PSP



Bibliography

Web Pages

<http://mapshare2.dse.vic.gov.au/MapShare2EXT/imf.jsp?site=bim> (Department of Environment and Primary Industries – Biodiversity Interactive Map)
<http://www.energyandresources.vic.gov.au/earth-resources/maps-reports-and-data/geovic> (GeoVic Interactive Online Maps)
<https://applications.vic.gov.au/apps/achris/public/home> (Aboriginal Cultural Heritage Resource Information System)
<http://www.weatherzone.com.au/climate/station.jsp?lt=site&lc=86282>. Weatherzone. Melbourne Airport Climate Averages.

Maps

Bulla Bulla no. 5, 185-?. Vale Collection. State Library of Victoria.

Plan of the Parish of Bolinda in the County of Bourke. 1854. Surveyor Generals Office Melbourne. Vale Collection. State Library of Victoria.

Victoria, Sunbury. 1917 Commonwealth Section Imperial General Staff. Australia 1:63,360 Topographic Series. State Library of Victoria.

Victoria, Sunbury. 1938. Australian Section Imperial General Staff. Australia 1:63,360 Topographic Series. State Library of Victoria.

Print Sources

Barker, M. 2011. *Proposed Residential Subdivision, 275 Racecourse Road, Sunbury Desktop, Standard and Complex Assessments CHMP*. Report for City of Hume.

Barwick, D., 1984. Mapping the Past: an Atlas of Victorian Clans 1835-1904. Part 1. *Aboriginal History*, 8(1-2), pp.100–131.

Clark, I.D., 1990. *Aboriginal Languages and Clans: An Historical Atlas of Western and Central Victoria, 1800-1900*, Melbourne: Department of Geography and Environmental Science Monash University.

du Cros and Associates. 1992a. *An Archaeological Survey of the Langi Kal Kal Property, Diggers Rest, Victoria*. Report to Urban Land Authority.

du Cros and Associates. 1992b. *An Archaeological Survey of the Caloola Training Centre, Sunbury, Victoria*. Report to the Urban Land Authority.

du Cros, H. 1993. *A Detailed Archaeological Survey of the Langi Kal Kal Property, Diggers Rest, Victoria*. Report to Department of Finance.

du Cros, H. 1995. *An Archaeological Investigation of Two Archaeologically Sensitive Areas, Jackson's Hill, Sunbury, Victoria*. Report to Collie Planning and Development Services and the Urban Land Authority.

Frankel, D. 1982. 'Earth Rings at Sunbury, Victoria'. *Archaeology in Oceania* 17: 89 - 97

- Freedman, D. L., and A. Parmington. 2015.** Targeted Cultural Values Inspection of PSP 1074 and 1075 Sunbury
- Griffin, D. and J. Ward. 2008.** *Archaeological Test Excavation of an area of Aboriginal Sensitivity, Viaduct Road Quarry (AAV7822-1908), Sunbury South Pump Station.* Report for Western Water.
- Jeffery, P.J. 1981.** *A Study of the Land in the Catchments to the North of Melbourne.* Former Soil Conservation Authority, Melbourne.
- Howell-Meurs, J., and J. Walker. 2012a.** *Diggers Rest - Stage 1A – Subdivision CHMP.* Report for Investa Nominees (2) Pty Ltd
- Howell-Meurs, J., and J. Walker. 2012b.** *Diggers Rest - Stage 1B – Subdivision CHMP.* Report for Investa Nominees (2) Pty Ltd
- Howell-Meurs, J., and J. Walker. 2012c.** *Diggers Rest - Stage 2A – Subdivision CHMP.* Report for Investa Nominees (2) Pty Ltd
- Howell-Meurs, J., and J. Walker. 2012d.** *Diggers Rest - Stage 3 – Subdivision CHMP.* Report for Investa Nominees (2) Pty Ltd
- Hyett, J. and C. Tucker. 2005.** *Cultural Heritage Assessment: The Sanctuary, Sunbury.* Report for Tomkinson Development Consultants.
- Long, A., R. Feldman and J. Howell-Meurs. 2005.** *Carmody Property Sunbury Road, Sunbury. Archaeological and Cultural Heritage Assessment.* Report to the Carmody Family.
- Marshall, B. and C. Webb. 2001.** *An Archaeological Survey of 'The Sanctuary' Sunbury.* Report for Foresite WSC Pty Ltd
- Matthews, L., M. Schlitz, A. Orr, A and G. Vines. 2006.** *Archaeological Investigations, Jacksons Hill Retarding Basin, Sunbury, Victoria.* Report for VicUrban.
- Murphy, A. 1995.** *Northwestern Wurundjeri Area: A Regional Archaeological Survey Stage 1*
- Murphy, A. 1996.** *Northwestern Wurundjeri Area: Regional Aboriginal Archaeological Heritage Survey Stage 2*
- Murphy, A. and L. Dugay-Grist. 2007.** *Macedon and Racecourse Roads, Sunbury Cultural Heritage Assessment.* Report to Stockland Pty Ltd.
- Noble, A., A. Cameron, A. Smith, H. Kiddell, J.Gatty, and M. Cupper. 2010.** *Sunbury Rail Electrification Project, Watergardens Station to Sunbury Station.* Report for Department of Transport
- Porch, N. and Du Cros, H. 1996.** *An Archaeological Investigation of a Third Archaeologically Sensitive Area, Jacksons Hill, Sunbury.* Report to Collie Planning and Development Services and the Urban Land Authority.
- Rhodes, D. 2000.** *An Archaeological Survey of the 'Riverlea' Property, Konagaderra Road.* Report to Ecology Australia and Tract Consultants.
- Rhodes, D. and H. du Cros. 1989.** *The Preliminary Archaeological Survey of the Upper Maribyrnong River Valley.* Report to the Melbourne Metropolitan Board of Works.
- Schlitz, M, G, Vines and A. Ford. 2006.** *An Archaeological Survey and Excavations at Viaduct Road, Jacksons Hill, Sunbury, Victoria.* Report for VicUrban.

Schultz, F. and L. Donati. 2012. *Emu Bottom Homestead Subdivision CHMP*. Report for Keith Altmann and Associates.

Spreadborough, R. & Anderson, H., 1983. *Victorian Squatters*, Ascot Vale: Red Rooster Press.

Sutherland, P. a T. Richards. 1994. *Shire of Bulla Aboriginal Archaeological Study*. Report prepared for Shire of Bulla, Australian Heritage Commission and Aboriginal Affairs Victoria.

Tucker, C., C. Kaskadanis and VicRoads. 2007. *Vineyard Road Duplication, Sunbury Cultural Heritage Management Plan*. Report for VicRoads.

Tulloch, J. 2003. *An Archaeological Survey at Lancefield Road, Sunbury East Victoria*. Report for Austcorp Group Ltd

Walther, E., I. Berelov and F. Thiele. 2011. *Cultural Heritage Management Plan for the Sunbury Electrification Project*. Report for Sunbury Electrification Project.

Weaver, F. 2006. *470 Sunbury Road, Bulla*. Report for Hansen Partnership Pty Ltd.

Xiberras, A. 1991. *An Archaeological Survey of the Organ Pipes National Park*. Victoria Archaeological Survey.

Appendix 1 – High Impact Activities defined in the *Aboriginal Heritage Regulations* 2007

Buildings and works for specified uses

- (i) aquaculture;
- (ii) a camping and caravan park;
- (iii) a car park;
- (iv) a cemetery;
- (v) a child care centre;
- (vi) a corrective institution;
- (vii) a crematorium;
- (viii) an education centre;
- (ix) an emergency services facility;
- (x) a freeway service centre;
- (xi) a hospital;
- (xii) an industry;
- (xiii) intensive animal husbandry;
- (xiv) a major sports and recreation facility;
- (xv) a minor sports and recreation facility;
- (xvi) a motor racing track;
- (xvii) an office;
- (xviii) a place of assembly;
- (xix) a pleasure boat facility;
- (xx) a research centre;
- (xxi) a retail premises;
- (xxii) a retirement village;
- (xxiii) a service station;
- (xxiv) a transport terminal;
- (xxv) a utility installation, other than a telecommunications facility, if—
 - (A) the works are a linear project that is the construction of an overhead power line with a length exceeding one kilometre or for which more than 10 power poles are erected; or
 - (B) the works are a linear project that is the construction of a pipeline with a length exceeding 500 metres; or
 - (C) the works are a linear project with a length exceeding 100 metres (other than the construction of an overhead power line or a pipeline with a pipe diameter not exceeding 150 millimetres); or
 - (D) the works affect an area exceeding 25 square metres.
- (xxvi) a veterinary centre;
- (xxvii) a warehouse;
- (xxviii) land used to generate electricity, including a wind energy facility.

Constructing specified items of infrastructure

- (a) an airfield;
- (b) a bicycle track with a length exceeding 100 metres;

- (c) a helipad;
- (d) rail infrastructure, other than—
 - (i) a railway track with a length of less than 100 metres; or
 - (ii) a railway track siding with a length of less than 100 metres; or
 - (iii) a cutting with a length of less than 100 metres; or
 - (iv) a tunnel with a length of less than 100 metres; or
 - (v) a bridge with a span of less than 100 metres; or
 - (vi) a platform with a length of less than 100 metres; or
 - (vii) a service road with a length of less than 100 metres;
- (e) a road with a length exceeding 100 metres;
- (f) a walking track with a length exceeding 100 metres;
- (g) a telecommunications line consisting of an underground cable or duct with a length exceeding 500 metres.

Dwellings

- (1) The construction of three or more dwellings on a lot or allotment is a high impact activity.
- (2) The carrying out of works for three or more dwellings on a lot or allotment is a high impact activity.

Subdivision of land

- (1) The subdivision of land into three or more lots is a high impact activity if—
 - (a) the planning scheme that applies to the activity area in which the land to be subdivided is located provides that at least three of the lots may be used for a dwelling or may be used for a dwelling subject to the grant of a permit; and
 - (b) the area of each of at least three of the lots is less than eight hectares.
- (2) The subdivision of land into two or more lots in an industrial zone is a high impact activity.

Alpine resorts

- (1) The construction of a building or the construction or carrying out of works in an alpine resort is a high impact activity if the construction of the building or the construction or carrying out of the works would result in significant ground disturbance.

Activities requiring earth resource authorisations

An activity is a high impact activity if it is an activity—

- (a) for which an earth resource authorisation is required before the activity may be carried out

Extraction or removal of stone

- (1) The extraction or removal of stone (other than sand or sandstone) that does not require an earth resource authorisation is a high impact activity if—
 - (a) the primary purpose of the extraction or removal is—
 - (i) the sale or commercial use of the stone; or
 - (ii) the use of the stone in construction, building, road or manufacturing works; and
 - (b) the land from which the stone is extracted or removed is more than 2000 square metres; and
 - (c) the extraction or removal would result in significant ground disturbance.

Extraction or removal of sand or sandstone

- (1) The extraction or removal of sand or sandstone (other than extraction or removal that requires an earth resource authorisation) is a high impact activity if the extraction or removal would result in significant ground disturbance.

Searching for stone

- (1) A search for stone is a high impact activity if it would result in significant ground disturbance.

Extraction or removal of loose stone on agricultural land on the Victorian Volcanic Plain

- (1) The extraction or removal of loose stone from the surface of land used for agriculture on the Victorian Volcanic Plain is a high impact activity if the extraction or removal—
 - (a) is for the primary purpose of land improvement, including pasture enhancement; and
 - (b) would result in significant ground disturbance.
- (1A) The crushing of loose stone on the surface of land used for agriculture on the Victorian Volcanic Plain is a high impact activity if the crushing is—
 - (a) by machinery; and
 - (b) for the primary purpose of land improvement, including pasture enhancement.
- (2) Subregulations (1) and (1A) do not apply if the land is used for crop raising or has been used for crop raising.

Timber production

- (1) The use of an area of land greater than 40 hectares in size for timber production is a high impact activity if—
 - (a) a permit is required under a planning scheme to use the land for timber production; and
 - (b) the use of the land for timber production would result in significant ground disturbance.
- (2) The construction of a building associated with timber production is a high impact activity if—
 - (a) a permit is required under a planning scheme to construct the building; and
 - (b) the construction of the building would result in significant ground disturbance.

Dams

The construction or alteration of a private dam, other than on a waterway, is a high impact activity if a licence is required under section 67(1A) of the **Water Act 1989** for the construction or alteration of the private dam.

Use of land

- (1) The use of land for a purpose specified in regulation 43(1) is a high impact activity if a statutory authorisation is required to use the land for that purpose.
- (2) The use of land for an extractive industry is a high impact activity if a statutory authorisation is required to use the land for the extractive industry.
- (3) The use of a lot or allotment for three or more dwellings is a high impact activity if a statutory authorisation is required to use the lot or allotment for three or more dwellings.