Crib Point Pakenham Pipeline

Aboriginal Cultural Heritage Desktop Assessment

Client: APA Transmission Pty Limited (ABN 84 603 054 404)

Author: Anita Barker

15 August 2018

Crib Point Pakenham Pipeline

Aboriginal Cultural Heritage Desktop Assessment

Client: APA Transmission Pty Limited (ABN 84 603 054 404)

Author: Anita Barker

Date: 15 August 2018

Front Cover: VAHR 7921-0036 from Denham Road, Tyabb (View SSW)

Contents

Figures

Tables

1. Introduction & Project Overview

APA Transmission Pty Limited, a wholly owned subsidiary of the APA Group (together referred to as APA) is proposing to construct and operate a 56.2 km in length high pressure gas pipeline which will connect AGL's proposed Gas Import Jetty at Crib Point to the Victorian Transmission System (VTS), near Pakenham ('hereafter referred to as the activity area' and associated works as the 'activity'). Archaeological Excavations has been commissioned to undertake a desktop Aboriginal cultural heritage assessment ahead of the proposed activity.

Upon completion, APA transmission pipeline and AGL's Gas Import Jetty will increase energy security and supply stability to Victoria. In addition, the pipeline will present other long term opportunities for the supply of gas to residential and industrial growth areas along the pipeline route and the potential for future power generation opportunities across the design life of the pipeline. The pipeline will also be designed in manner that will enable reverse flow from the main VTS connection at Pakenham to future customers connected to the pipeline.

The proposed AGL gas importing jetty project will consist of a Floating Storage and Regasification Unit (FSRU) continuously moored at the existing Crib Point Jetty. The FSRU will vaporise the natural gas from a visiting Liquefied Natural Gas (LNG) carrier that will moor directly adjacent to the FSRU. The natural gas will then be transferred to APA's Crib Point Receiving Facility via a marine loading arm and jetty piping. The high pressure gas pipeline will transfer the generated gas from the Crib Point Receiving Facility to the APA Pakenham Delivery Facility where it is conditioned to maintain the operating parameters of the VTS before injection.

1.1. Purpose of the Report

The aim of this report is to provide a detailed desktop assessment of the known Aboriginal cultural heritage values of the activity area. Therefore, the objectives of this report are to:

- Identify Aboriginal cultural heritage and areas of cultural heritage sensitivity within the activity area.
- Assess the impact of the proposed activity on Aboriginal cultural heritage within the activity area.
- Provide guidelines to manage the impact of the activity on Aboriginal cultural heritage within the activity area and to ensure the project complies with relevant State and Commonwealth legislation.

1.2. The Activity Area

The activity area comprises a 56.2 km long alignment within an approximate 30m wide easement that includes additional construction locations relating to set down and welding areas, bell holes, temporary dams and access roads associated with the installation of a gas pipeline. Under-boring will occur in the activity area under named waterways and sealed roads. The activity area commences at Cribb Point in the south, terminates at Pakenham in the north and traverses the eastern Melbourne suburbs of Cribb Point, Hastings, Tyabb, Pearcedale, Tooradin, Cardinia, Rythdale, Dalmore, Pakenham and Nar Nar Goon (Figure 1).

The Crib Point Pakenham Pipeline project consists of the following components:

- 56.2km of high pressure gas transmission pipeline with a diameter of 600mm with a minimum cover of 1.2 m from ground level.

- Crib Point Receiving Facility situated at landside of the Crib Point Jetty managed by Port of Hastings Development Authority (PoHDA) and include metering, pigging facility, nitrogen storage and injection, odourant plant, gas analysers and a vent stack.

- Pakenham Delivery Facility situated adjacent to the Pakenham East Rail Depot, which is within land owned by Public Transport Victoria and include a scraper station, filtration, metering, heating, pigging facility and a vent stack.

- Two mainline valves (MLVs) will be situated along the pipeline at kilometre point (KP)12 and KP40. MLVs are provided as a means to isolate the pipeline in segments for maintenance, repair, operation, and for the minimisation of gas loss in the event that pipeline integrity is lost. Once isolated, the gas from the relevant pipeline section may be vented prior maintenance taking place. A typical MLV site comprises of 10 m x 10 m fenced compound.

- Cathodic protection (CP) is to be provided via a combination of crossbonds to existing CP system and the installation of an impressed current system at either of the MLVs which will be determined during detailed design. The pipeline primary corrosion protection system shall be its external coating.

1.3. Limitations

This study is limited to a review of the relevant heritage databases and archaeological investigations only (i.e. a desktop assessment) as no fieldwork (survey and /or subsurface testing) was undertaken for this assessment. Historical heritage values within the activity area are not discussed here as a separate report will address this.

Figure 1: Location of the activity area

2. Legislation

This section provides an overview of the relevant legislation and guidelines for the management of Aboriginal cultural heritage.

2.1. EPBC Act 1999

The *Environment Protection and Biodiversity Conservation (EPBC) Act* 1999 provides protection for Australia's natural, Indigenous and historical heritage. The Act applies to:

- World heritage properties
- National heritage places
- Commonwealth heritage places
- Wetlands of international importance (often called 'Ramsar' wetlands after the international treaty under which such wetlands are listed)
- Nationally threatened species and ecological communities
- Migratory species
- Commonwealth marine areas
- Great Barrier Reef Marine Park
- Nuclear actions (including uranium mining)
- A water resource, in relation to coal seam gas development and large coal mining development.

Features of the *EPBC Act* 1999 relevant to this report include:

- A National Heritage List of places of national heritage significance.
- A Commonwealth Heritage List of historical heritage sites owned or managed by the Commonwealth.
- The creation of the Australian Heritage Council, an independent expert body to advise the Minister on the listing and protection of historical heritage sites.

Any action (activity) that is likely to have a significant impact on heritage properties and places must be referred to the Minister and undergo an environmental assessment and approval process.

2.2. The Planning & Environment Act 1987

The *Planning and Environment Act* 1987 as well as the *Planning Schemes Act* 1996 provides a framework for local government in planning the use, development and protection of land in

Victoria. It also sets out the process for obtaining permits and enforcing compliance with planning schemes and permits. The Act provides for:

- A system of planning schemes that sets out how land may be used and developed.
- The Victoria Planning Provisions that set out the template for the construction and layout of planning schemes.
- The procedures for preparing and amending the Victoria Planning Provisions and planning schemes.
- The procedures for settling disputes, enforcing compliance with planning schemes, and other administrative procedures.

One of the objectives of the *Planning and Environment Act* 1987 is to 'conserve and enhance those buildings, areas or other places which are of scientific, aesthetic, architectural or historical interest or otherwise special cultural value' (Section 4 (d)). Applications for planning permits submitted to local governments may be forwarded to Heritage Victoria as referral authorities but only if the body determining the planning application believes there is cause to do so. A requirement for a Heritage Assessment can be included as a condition for the issue of a Planning Permit by the determining Authority (Section 62 (g)).

Part 2 of the Planning Schemes Act 1996 sets out guidelines for use by local government for determining a planning application, which includes reference to cultural heritage including archaeological sites. Site and places may be protected within a planning scheme by the use of a Heritage Overlay and Significant Landscape Overlays and the attached schedules. Most Victorian local governments have Heritage Overlays in place.

Section 85 of the Pipeline Act 2005 provides an exemption form the need to obtain planning approvals under the Planning and Environment Act 1987. The Project is however, subject to any other relevant Victorian environmental legislation including the *Heritage Act* 2017.

2.3. Environment Effects Act 1978

The *Environmental Effects Act* 1978 requires certain public works to undertake an environmental impact assessment. European/Historical Heritage and Aboriginal Cultural Heritage forms part of the referral criteria in accordance with the Ministerial Guidelines for assessment of environmental effects under the *Environmental Effects Act*. A combination of two or more of specified types of potential effects on the environment may warrant a referral. One of the referral criteria is whether there are potential extensive or major effects on Aboriginal and/or historical heritage places listed on the Victorian Aboriginal Heritage Register, the Heritage Register or the Archaeological inventory. A Cultural Heritage Management Plan

is automatically triggered if an Environmental Effects Statement (EES) is required for an activity.

If a project requires assessment under both the *Environment Effects Act* 1978 and the *Environment Protection and Biodiversity Conservation Act* 1999, the relevant process can be accredited under the new Assessment Bilateral Agreement between the Commonwealth and Victoria. This means that proponents will not have to undertake two separate assessment processes.

2.4. Aboriginal Heritage Act 2006

The *Aboriginal Heritage Act* 2006 provides protection for all Aboriginal cultural heritage in Victoria. The Aboriginal Heritage Regulations 2018 gives effect to the Act. There are two principal mechanisms under the Act to manage Aboriginal cultural heritage:

- Cultural Heritage Permit
- Cultural Heritage Management Plan

Cultural Heritage Permit

A Cultural Heritage Permit is required to:

- Disturb or excavate land to uncover or discover Aboriginal cultural heritage.
- Rehabilitate land at an Aboriginal place.
- Repatriate/inter Aboriginal ancestral remains at an Aboriginal place.
- Carry out research on an Aboriginal place.
- Carry out an activity that will, or is likely to, harm Aboriginal cultural heritage.
- Sell an Aboriginal object (where it was not made for the purpose of sale).
- Remove an Aboriginal cultural heritage object from Victoria.

A Cultural Heritage Permit (CHP) is required in these instances even if a Cultural Heritage Management Plan is not, in order to undertake the activities lawfully. The CHP application must be made to the Registered Aboriginal Party (RAP), or in areas where there is no RAP to the Secretary to the Department of Premier and Cabinet.

Cultural Heritage Management Plan

A Cultural Heritage Management Plan (CHMP) is a report detailing the results of investigations (background and/or fieldwork, further detailed below) which provides a framework in which to manage Aboriginal cultural heritage that may be present in an activity area. In Victoria, the

Aboriginal Heritage Act 2006, the *Aboriginal Heritage Amendment Act* 2016, and the Aboriginal Heritage Regulations 2007 are the relevant legislative documents which act to protect Aboriginal cultural heritage and to define the requirements and standards of CHMPs. The underlying philosophy of a CHMP is to minimise harm to Aboriginal places identified in the activity area during the CHMP assessment and provide a framework to manage Aboriginal cultural heritage that may be identified during the activity. However, it is the document through which provisions can be made to legally harm Aboriginal places where harm avoidance or minimisation is not possible. A CHMP must be approved by a Registered Aboriginal Party, or where no party exists for the area the Secretary Department of Premier and Cabinet, prior to the activity commencing for activities that require a CHMP.

Under r.60 of the Aboriginal Heritage Regulations 2018 a CHMP assessment may involve:

- A Desktop Assessment (in compliance with r.61) includes presentation of background research regarding the environmental, ethno-historical, archaeological and European history of the activity area. The Desktop Assessment must include the following: a search of the Victorian Aboriginal Heritage Register (VAHR); the identification of a study area for the activity area; a review of archaeological reports and published works relating to Aboriginal cultural heritage in the study area; a review of historical and ethno-historical accounts of Aboriginal occupation in the study area; a review of landforms in the activity area in light of cultural heritage sensitivity; and a review of the land use of the activity area that may have impacted on the Aboriginal cultural heritage material, if present, in the activity area. The focus of the Desktop Assessment is to place the activity area in a regional context in order to provide information on the probable nature of Aboriginal places in the activity area. The results of the Desktop Assessment will determine whether the CHMP is progressed to a Standard and/or Complex Assessment to assess the cultural heritage sensitivity of the activity area where it has been shown that Aboriginal cultural heritage is present, or it is reasonably possible to be present, in the activity area.

- A Standard Assessment (in compliance with r.62 and r.63) comprises a ground survey of the activity area and is required where a Desktop Assessment has shown that it is reasonably possible that Aboriginal cultural heritage is present in the activity area. The ground survey is undertaken to establish whether any visible Aboriginal cultural heritage is present in the activity and if locations likely to contain Aboriginal cultural heritage are present in order to assess the archaeological sensitivity of the activity area. If a Complex Assessment of all, or all relevant parts of, the activity area is carried

out following a Desktop Assessment, a Standard Assessment for that area is not required.

- A Complex Assessment (in compliance with r.64 and r.65) is required if the Desktop Assessment or Standard Assessment shows that it is reasonably possible for Aboriginal cultural heritage to be present in the activity area and it is not possible to identify the nature, extent or significance of the Aboriginal cultural heritage in the activity area unless a Complex Assessment is carried out. A Complex Assessment comprises excavation of all of, or part of, the activity area to uncover or discover Aboriginal cultural heritage and to establish the stratigraphy of the activity area. A minimum requirement of the Complex Assessment is a controlled manual excavation (comprising a 1x1m excavation pit) of each landform within the activity area before any other excavation or disturbance is undertaken.

A CHMP is required for an activity if part or all of the activity area for the activity is considered to be an area of cultural heritage sensitivity (r.7 of the regulations), and all or part of the activity is a high impact activity.

3. Methodology

The desktop assessment involved a search of the Victorian Aboriginal Heritage Register (VAHR) maintained by Aboriginal Victoria in order to identify the number and type of Aboriginal places registered in the activity area as well as the presence of Ramsar sites. In addition, a regional review of the geomorphic units, landforms, past land use, historic and ethno-historic accounts, and previous archaeological investigations pertinent to the activity area, was undertaken in line with the requirements for a CHMP desktop assessment.

The study area selected for this assessment extends in an approximate 1km radius from either side of the centre line of the activity area. Maps (geomorphic, geology, Aboriginal places) in this section are presented in two parts in order show greater detail.

4. Desktop Assessment

The following section provides an overview of the study area and includes information on the geomorphic units, landform, past land use, historic and ethno-historic accounts pertinent to the activity area. This is followed by a review of previous registered Aboriginal places and archaeological investigations undertaken in the study area. The purpose of this review is to provide an overview of Aboriginal cultural heritage that is present in the study area and the

activity area, and to inform a site prediction model for the potential for Aboriginal cultural heritage to be present in the activity area. Parts of the information in this section are drawn from previous archaeological assessments undertaken by the author in the region.

4.1. Landforms Within The Study Area

The study area selected for this report extends in an approximately 2km radius from the activity area (as determined by r.7 of the proposed plans) as there are no appropriate natural boundaries (geological, topographical) that could be used to determine the study region. This broad study area includes a representative sample of a variety of landforms that are found in the activity area and Aboriginal places within the region.

The geomorphology of the study area is shown in Figure 2 and Figure 3 and comprise:

- 3.3.2 Hills and Low Hills (Barwon Downs, French Island) mostly comprised of early Neogene sediments, most of which are overlain by later sand sheets. The soils are either yellow and brown texture contrast soils (Chromosols, Kurosols) or, on the deep sands, acidic bleached sands with “coffee rock” (Podosols) (VRO website).
- 7.1.1 Coastal Plains with Ridges and Dunefields (Brighton, Cranbourne) formed over Neogene sediments, generally mantled by a layer of sand of variable thickness. The series of low parallel northwest trending dune ridges that lie parallel to the present coastline are believed to represent stranded Neogene dune ridges or former coastlines. The soils are either acidic sandy texture contrast soils (Chromosols) or deep, strongly acid sands with bleached subsoil and a hard, dark brown “B” horizon of “coffee rock” at about 80cm, composed of organic matter and aluminium and/or iron compounds (Podosols) (VRO website).
- 7.1.3 Former Swamps and Lagoonal deposits (Koo Wee Rup, Tobin Yallock, Bass river Delta, Carrum Downs). The former swamps and lagoonal deposits are the result of swamp deposits from streams and rivers including the Dandenong and Eumemmerring creeks that flowed into the former Carrum swamp, the Cardinia Creek and Bunyip River that flowed across the alluvial plains south of Pakenham into the former Koo-Wee-Rup Swamp. The main soil type, Koo Wee Rup peaty clay, has about 300mm of dark greyish brown to dark brown loam or light clay surface soil with high amounts of peat or organic matter. This peat, which was originally deeper, accumulated in the marshes and lagoons fed by slow-moving water. Since drainage, much peat has disappeared through shrinkage, consolidation, burning and blowing. Below the peat layer, dominantly dark grey medium or heavy clays occur, passing at about 500mm to mottled paler grey and yellow-brown mottled medium to heavy. The

clay continues to at least 1.8 m. Variable amounts of gritty sand to gravel may occur throughout the soil profile (VRO website).

- 7.1.2 Alluvial Plains (Nar Nar Goon, Caldermeade, Bass River Plain). The plains developed in the lower reaches of the Dandenong, Cardinia and Tynong Creeks and the Bunyip, Lang Lang and Bass Rivers. The drainage eventually flowed into swamps and lagoons, described under Section 7.1.3. Since the drainage of the swamps, drains now confine the flows of all these rivers and streams. Most of the alluvial plains have texture contrast soils (mostly Kurosols) but there are areas of grey clays. The original vegetation on the plains was mostly comprised of swamp scrub, but some areas would have been swampy grasslands and grasslands (Vertosols) (VRO).
- 1.3.1 Low relief landscapes at low elevation (Cann River to border, Silvan, Templestowe) within the southern side of the Eastern Uplands is characterised by a dissected plateau-like surface of hills known as the Nillumbik Terrain extending from the eastern suburbs of Melbourne (e.g. Camberwell and Templestowe) around Mt Dandenong and further eastwards to the NSW border. The soils are generally red to yellow acid texture soils (Kurosols) (VRO website).

The geology of the activity area is characterised by unnamed coastal dune deposits (Qld1), swamp and lake deposits (Qm1), the Brighton Group (Nb), alluvium and colluvium deposits (Qb), Red Bluff Sandstone (Nbr), Seacombe (Sm), coastal lagoon deposits (Qg), alluvium deposits (Qa1), swamp deposits (Qc) and Thorpdale Volcanic Group deposits (-Put) (Figure 4 and Figure 5). Landforms within the study area generally comprise low-lying land (<20m asl) containing dune and swamp deposits with low-lying areas on the coast subject to inundation.

During low sea level periods in the Pleistocene era the Yarra River flowed over the Port Phillip plains and collected behind the dunes of the Nepean Bar (formed about one million years ago across the upper part of Port Phillip Sound), finding a variety of outlets into the sea. These outlets became ancient tideways as the sea level rose. Tootgarrook is one example of a tideway that was blocked by sand dunes. Approximately 25,000 years ago sea levels rose and flooded the Port Phillip Plains. Westernport Bay was formed in a similar manner to Port Phillip Bay but is geologically more recent being formed in the last 20,000 years and is associated with the Tyabb fault (The Advisory Committee, Westernport Regional Planning 1971:13).

Baxter Sandstone in the region was formed when large thickness of sand and mud were deposited in the shallow seas that covered all four of the Tertiary Basins in South East Australia. It comprises coarse sandstone with well rounded quartz grains cemented together by iron oxide (Cochrane et. al. 1999:157).

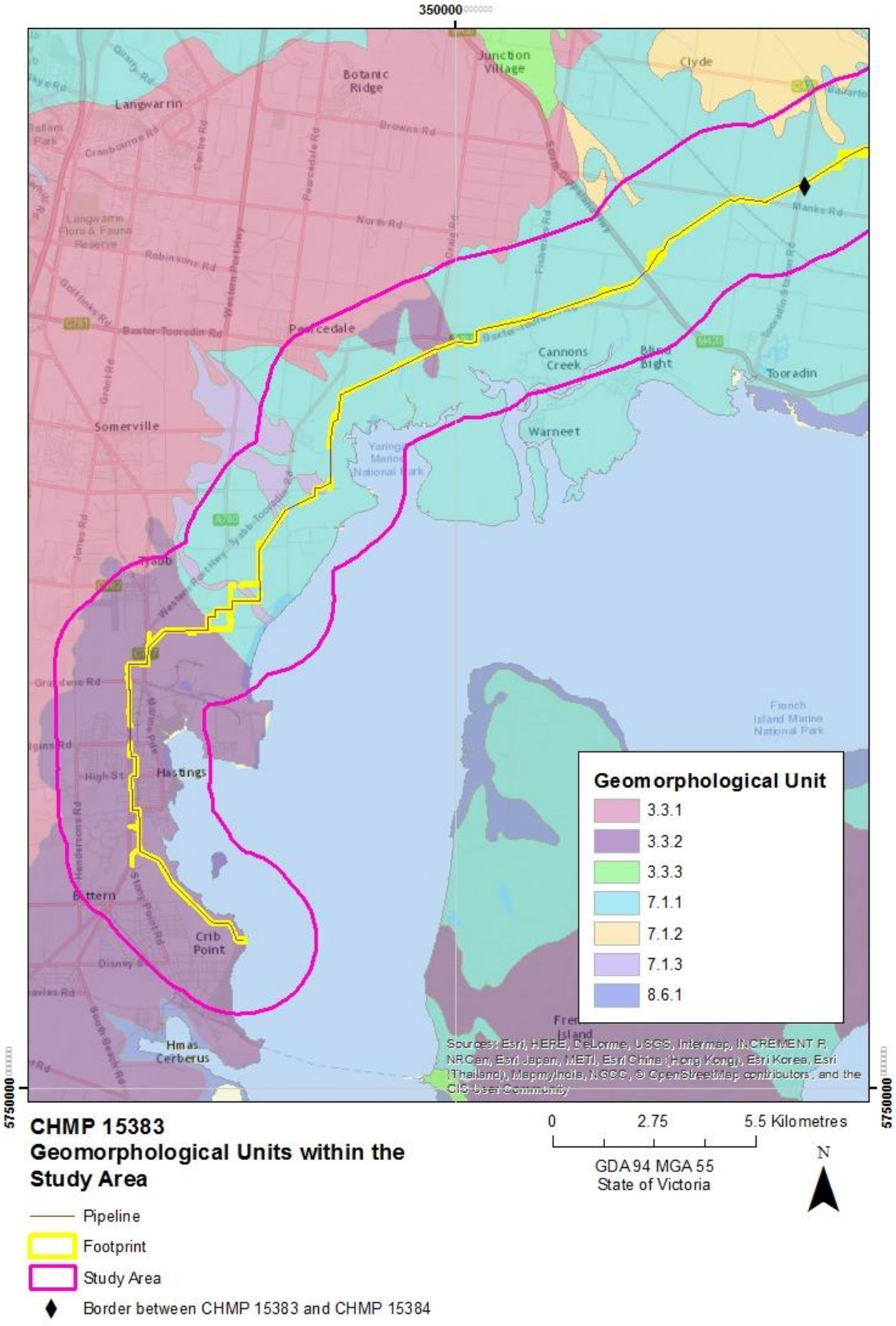

Figure 2: Geomorphological units within the study area (map 1 of 2)

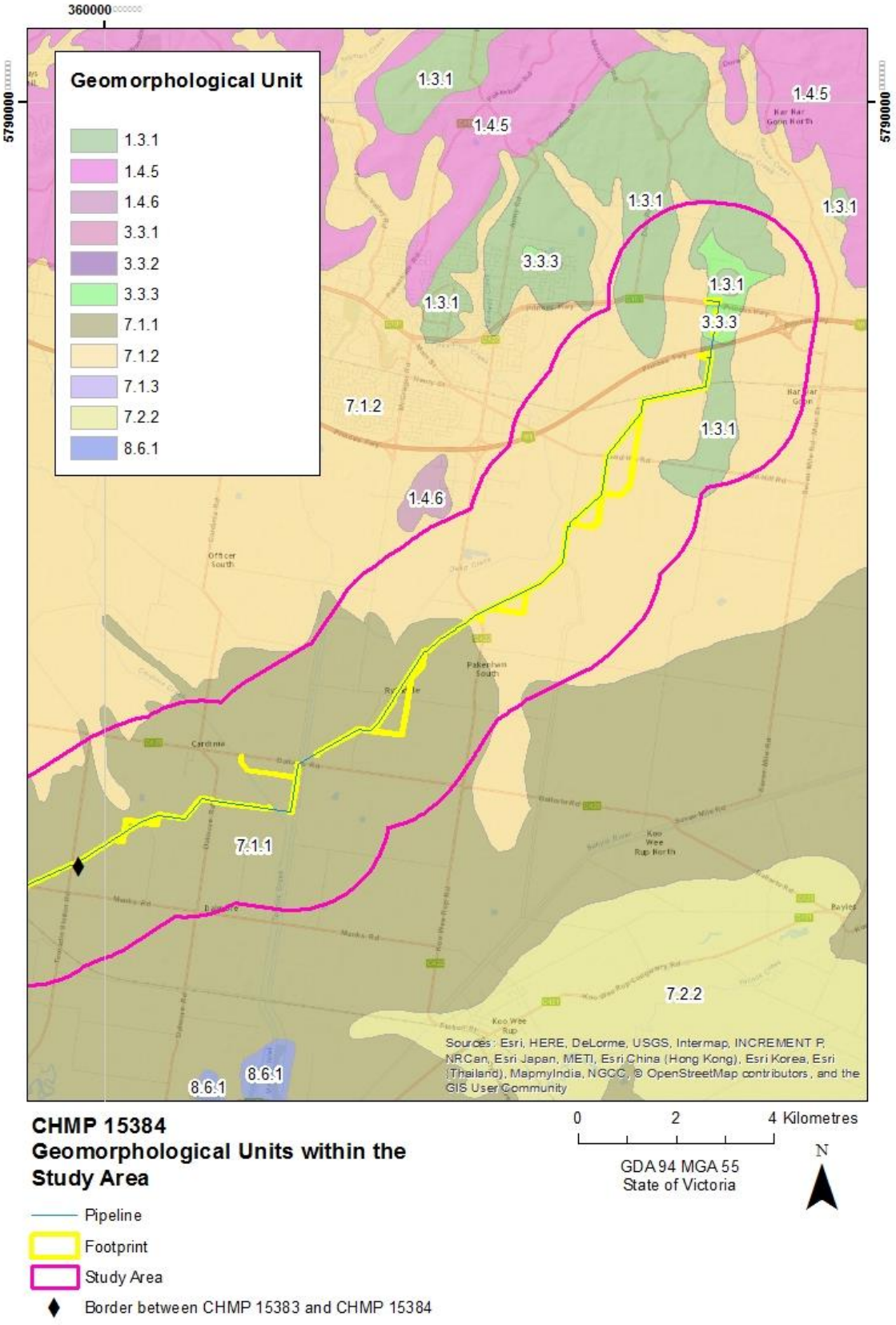

Figure 3: Geomorphological units within the study area (map 2 of 2)

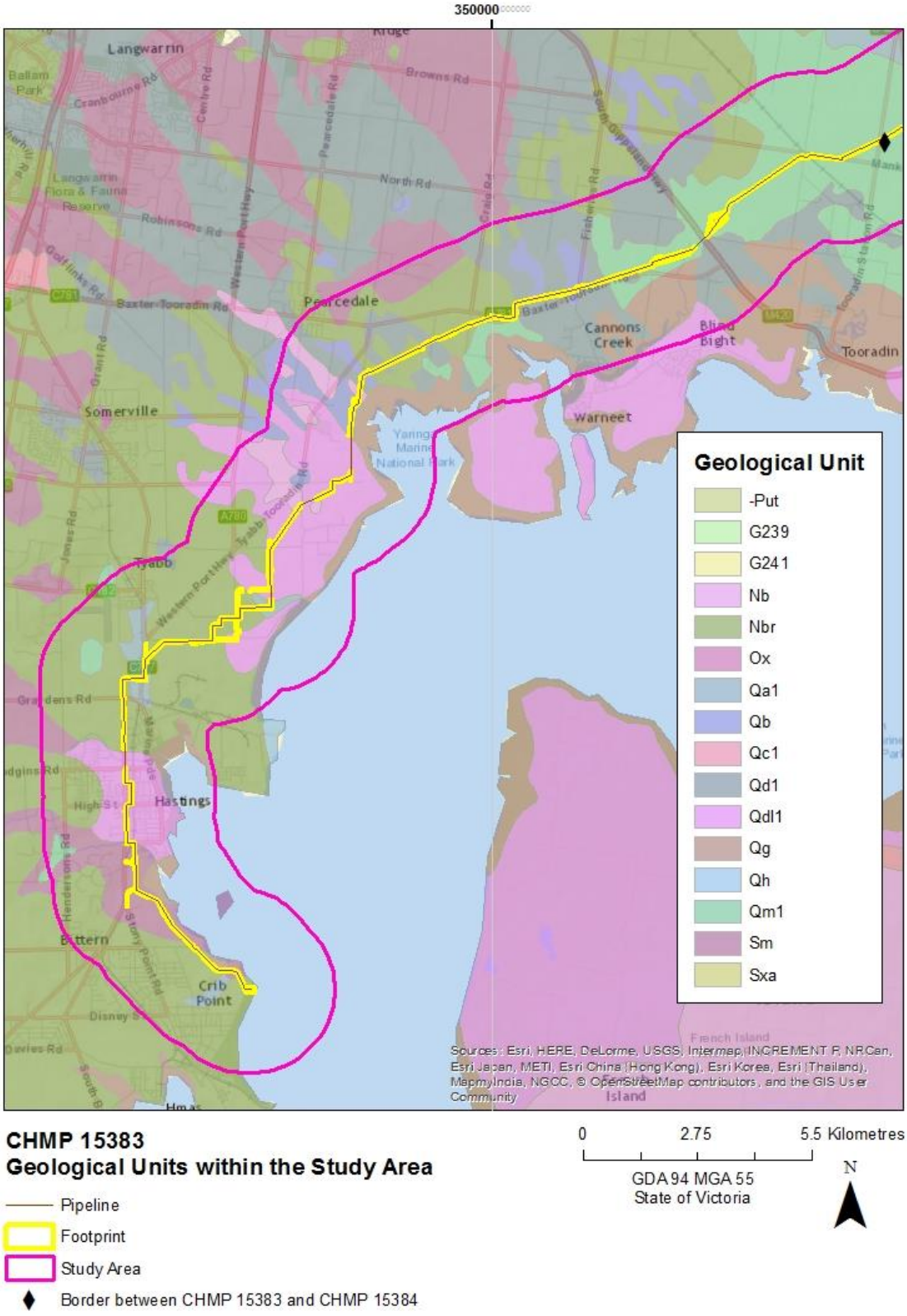

Figure 4: Geology of the study area (map 1 of 2)

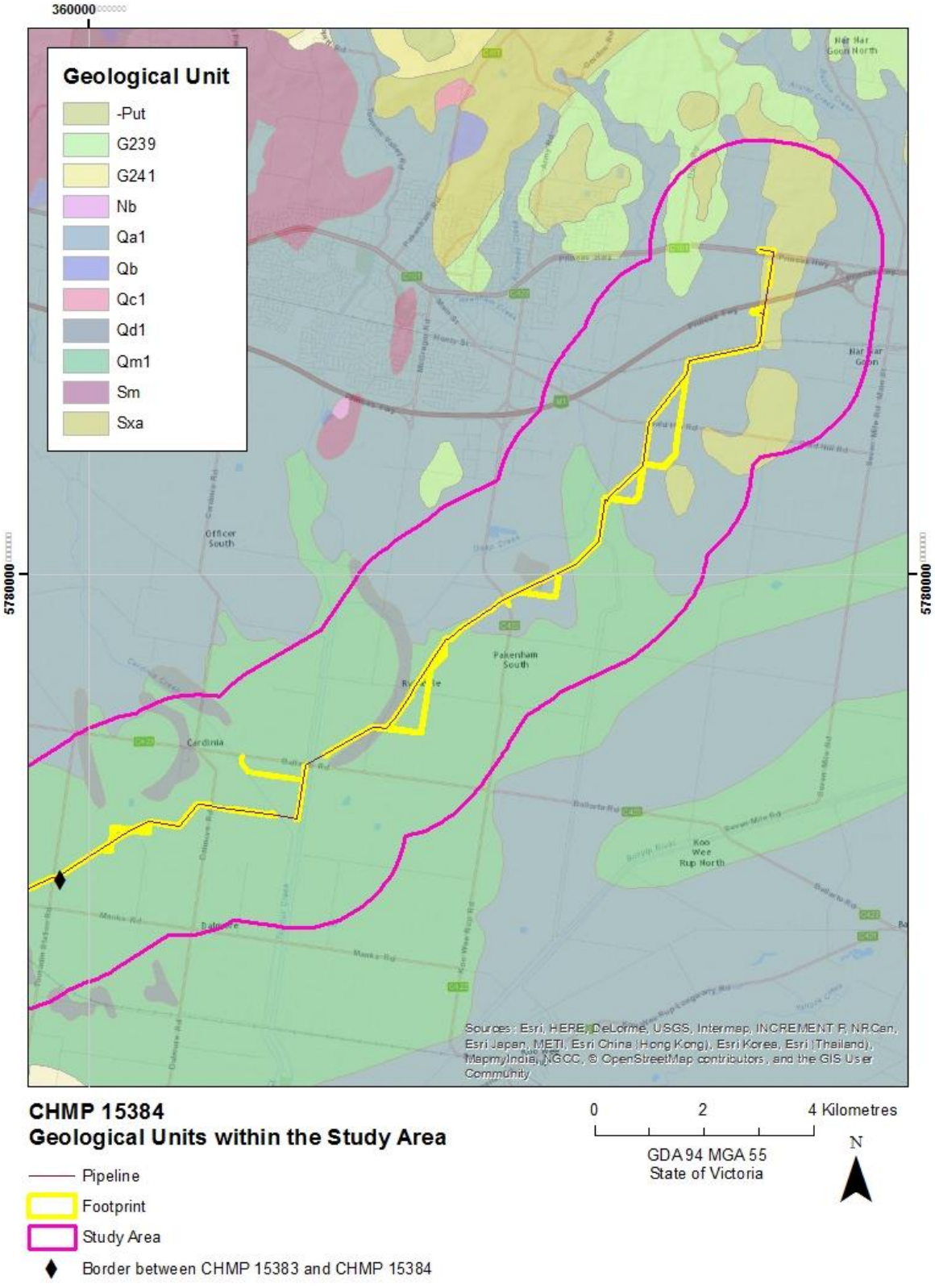

Figure 5: Geology of the study area (map 2 of 2)

The Cardinia, Dalmore and Koo-Wee-Rup area is part of a former river delta system with sand ridges traversing low-lying swampy terrain. Extensive swamp deposits were laid down in the Westernport sunkland during the late Quaternary to recent period. These sediments were deposited by the Cardinia, Ararat, Toomuc and Deep Creeks. This swamp was known as the Koo-Wee-Rup Swamp and roughly covered the area mapped in this report as Dalmore clay and Koo-Wee-Rup peaty clay. The sand ridges in this area are believed to represent levee and channel deposits associated with prior streams (larger than those existing today) (Jenkins 1962). Some sandy crescent shaped dunes also occur in the Cardinia area. These are called 'lunettes' and are sandy deposits that were blown out of ancient lake beds during drier climatic times (VRO website).

Tooradin geology comprises swamp deposits (Qc) and consists of peat, peaty clays and clays extending to 12m in some parts and predominately aeolian sands (Qd). The sands are often in the form of north-west south-east trending dunes with dune ridges becoming less distinct near the coast, possibly due to re-working. In the vicinity of Cardinia and Devon Meadows, several smoothly-curving ridges of coarse sand occur projecting southwards from a more continuous sheet of sand to the north. The sand in this area is thought to have been deposited by streams flowing from the north to Westernport Bay. The sand sheets appear to overlie grey mottle sandy clays. Miocene ferruginous sediments are present throughout Devon Meadows, this formation is continuous with the Baxter Sandstone. Silurian rock in the area consists of shales, siltstones and sandstones (Jenkins 1962: 4-6).

The activity area is dissected by numerous named waterways: Warringine Creek; Kings Creek; Olivers Creek; Langwarrin Creek; Rutherford Creek; Deep Creek; Toomuc Creek; Lower Gum Scrub Creek; and Cardinia Creek. Many of the creeks have been subject to substantial modification through prior realignment of the creek corridors associated with drainage and agricultural practices. Numerous unnamed tributaries of these named waterways and unnamed waterways also dissect the activity area as well as recently constructed drains and drainage lines. These waterways would have provided potable water for Aboriginal people in the past as well associated flora and fauna resources.

The former swamps and lagoonal deposits in part of the study area are the result of swamp deposits from streams and rivers that flowed into the Cardinia Creek and flowed across the alluvial plains south of Pakenham into the former Koo-Wee-Rup Swamp (includes the Dalmore Swamp) (VRO website). The Koo Wee Rup, Dalmore and Tobin Yallock swamps originally covered a large section of the region and are discussed in detail here due to the possibility of remnant landforms associated with the swamps occurring in the study area.

The Koo-Wee-Rup Swamp is a prominent feature in the study area and was contiguous with the Dalmore Swamp to form a major wetland complex with an east-west orientation. With maximum dimensions estimated at 32km by 14km in size and at least 30,000 ha in area, this was the largest swamp in Victoria. The swamp itself developed after the last Ice Age in what had previously been an arid or semi-arid landscape. A dry climate is indicated by what appear to be wind-formed curved dunes (lunettes) on the east side of former intermittent lakes. With climate warming during the early-mid Holocene there was more rainfall which resulted in a permanent stream flow into the Koo-Wee-Rup Swamp, with the Bunyip River being the main contributor. There was only one episode of peat formation, which persisted up to the time of drainage. The outer swamp consisted of extensive scrub dominated by Swamp Paperbark which grew on mineral soil rather than the organic peat of the inner swamp, the Swamp Paperbark requires drainage and is not tolerant of permanent inundation. The core of the swamp was a very different environment, being relatively open and dominated by permanently inundated reeds and rushes growing on deep peat possibly with lake-like cells and open water bodies. Narrow sinuous sandy rises slightly above the present surface are widespread in the swamp area, both inside and outside the area of the former peat deposit. Many rises are modified by gravel extraction but they were probably mostly less than 50cm in height with some reaching 1m. These sandy rises are abandoned levees and other stream deposits probably forming part of an extensive alluvial fan made by the Bunyip River during the Last Glacial Maximum prior to swamp formation (VRO website).

The Dalmore Swamp was fed mainly by Cardinia Creek, and was known for its dense, almost impassable scrub. It occurred on mineral alluvial soil rather than the peat of the inner Koo-Wee-Rup Swamp. Before it was drained and cleared, some areas have a buried peat layer within the soil profile which is valuable in vegetable crop production due to its moisture retention, the overlying black clay preventing it from being lost. Buried peat suggests it was once part of the inner swamp but geological uplift within the local catchment of the western feeder streams reduced their catchment size and stream flow, leading to cessation of peat formation and deposition of black clay. The buried peat layer is not throughout the Dalmore area, suggesting a complex geological history (VRO website).

The Tobin Yallock Swamp was a former extensive swamp that was fed mainly by the Lang Lang River and Gum Scrub Creek and was south of the Yallock grasslands. It consisted largely of Swamp Paperbark fanning out to form a 6km length of the north-east coast of Westernport Bay. There was no single outlet of the Lang Lang River, water issuing from the swamp via numerous rills of continually running fresh water (VRO website).

The former swamp soils have high clay content and crack when dry (Vertosols). Around Dalmore the soils have a naturally friable surface (self mulching) and are used for high value crops including asparagus. A large proportion of the soils around Koo-Wee-Rup still retain a thin peaty layer surface (VRO website).

4.2. Flora and Fauna Aboriginal Resources in the Study Area

The study area is situated predominately in the Gippsland Plains (GipP) bioregion. Prior to European contact the vegetation of the study area would have predominately comprised coastal scrub (EVC website). Vegetation such as Coast Tea-tree (*Leptospermum laevigatum*), Coast Banksia (*B. integrifolia*), Coast Wattle (*Acacia longifolia*) and Coast Beard-heath (*Leucopogan parviflorus*) would have occurred on the dune systems. Several other species such as Moonah (*Melaleuca lanceolate*), Wirilda (*Acacia retinodes var. uncifolia*), Pale Turpentine-bush (*Beyeria leschenaultia*) and Thyme Rice-flower (*Pimelea Serpyllifolia*) may have occurred on the calcareous dunes (Costermans 2008:135). Understory vegetation such as tussock grasses and Bower Spinach (*Tetragonia implexicoma*) along with other small herbs and shrubs would have been present within the study area. The plant resources of the region would have been Aboriginal economic resources utilised for food, medicines and as raw material for tool manufacture. Areas of fresh and coastal water sources in the study area would have been utilised for seasonal plant stables (Zola & Gott 1992:1-19).

Besides littoral sources of fish, seals and shellfish, food resources in the study area would have centred on native fauna. Seabirds such as Cormorants (*Phalacrocorax sp.*) and Sandpipers (*Calidris sp*) would have provided eggs as well as meat. Other fresh water and swamp dwelling species, namely Black Swans (*Cygnus atratus*) and various duck species (*Anas sp*) would have been available (Cronin 2008:33-40). The Eastern Grey Kangaroo (*Macropus giganteus*), Swamp Wallaby (*Wallabia bicolor*), Common Wombat (*Vombatus ursinus*), Echidna (*Tachyglossus aculeatus*), Possum (*Trichosurus vulpecula*) and Common Ring-tailed Possum (*Pseudocheirus peregrinus*) would have been some of the larger economic resources utilised by Aboriginal people in the region (Menkhorst & Knight 2004:44, 86, 118, 126). Other Aboriginal economic resources include the Red-bellied Black Snake (*Pseudechis porphyriacus*) and Eastern Tiger Snake (Notechis scutatus), the Eastern Blue-tongued Lizard (Tiliqua scincoides) and the Swamp Skink (*Egernia coventryias*) as well as other small reptiles common in scrubland and waterway environments (Cronin 2008:83, 86).

4.3. Impacts of European Settlement & Land Use on Aboriginal Cultural Heritage

This section broadly summarises European settlement in the study area. European land use practices commenced in the early 1840s in the region and will have impacted Aboriginal places where present in the study area.

Westernport

Shortly after the establishment of Melbourne in 1835 settlers began to take up land in the wider region. The settlement of the Westernport area commenced in the 1840s as pastoral holdings were taken up by settlers. Throughout the 1840s there were three main tracks or primitive roads to settlers' homesteads into the Westernport district. The principal route went from Dandenong to Narre Warren and Tooradin and the Inlets. Another route was the coast road from Mt Eliza, crossing the Carrum Swamp to Ballymarang and Balla. The third route was the fore runner of the Westernport Highway (Gunson 1968:54).

Tyabb

Tyabb was the first township to be surveyed in the district and named. It is now recorded as Old Tyabb township and is located to the north of the Hastings primary school. The name Tyabb is believed to have originated from the Aboriginal work 'tyaba' meaning mud hole or land of waterholes (Blake 1977:262).

Tooradin

In 1884, Tooradin Plain was sold to George Fairbairn who also purchased the Yallambie property. Land clearing and drainage was commenced and by the late 1890s the land had been subdivided into smaller lots. The main land use centred on sheep farming and the planting of crops such as oats. The opening up of the Westernport Road led to the settlement of Tooradin, previously a focus of fishing activities. From the 1880s the Tooradin area was subdivided into 20-acre blocks and opened for closer settlement (Gunson 1968:124).

Koo Wee Rup

Another increase in settlement in the region occurred in the early 1900s and an influx of soldier settlers and private farmers led to the growth of Koo Wee Rup. The settlement of Koo Wee Rup (known as Yallock until 1890) was greatly influenced by the draining of the swamp with the population increasing by 500 people between 1908 and 1923. Despite bad floods in 1923 and 1924, when water lay six feet deep in the cheese factory, further areas of the swamp were drained for additional closer settlement. The settlers demanded that contour drains be

constructed around the swamp to prevent future inundation and Hagelthornes Drain was planned (Gunson 1968:56-57, 156-157, 197-199).

Following the closer settlement schemes of the late nineteenth and early twentieth century land in the activity area was further divided up into smaller landholdings after the passing of the Discharged Solider Settlement Act 1917. Many areas, particularly in drained swamp areas such as Koo Wee Rup, proved unsuitable for closer settlement with many of the blocks unsuitable for intensive cultivation and too small. In addition, many of the settlers were ill equipped to the task of farming and many holdings were later abandoned. However, the *Solider Settlement Act* 1945 proved to be more successful (Nelson & Alves 2009:285). By 1944, Koo Wee Rup was the largest business centre in the shire and a high school was opened in 1953 (Gunson 1968:218).

In 1934 a 'super' flood was recorded in the Koo Wee Rup district inundation the entire area including the township. In 1936 a Royal Commission was set up to examine the efficiently of the water supply, drainage and irrigation. The commission suggested improvements providing outfalls for the Deep and Cardinia Creeks with the existing Cardinia drains utilised to handle the waters of Toomuc and Gum Scrub Creeks (Gunson 1968:204-208).

Cardinia

In 1853 the runs around Cardinia Creek were subdivided and sold. In 1861-64 J. Connelly held a lease for about 60,00 acres of unoccupied land known as Koo Wee Rup Swamp. In 1867 the lease passed to Graham Berry and Thomas Lowrey, cattle graziers, who reported numerous flooding events in the region. Work on a drainage scheme commenced in 1888 and during the depression of the 1890s this provided relief work. By October 1892, 500 men were at work draining the swamp and nine miles had been completed with numerous major drains and outlets constructed including the Cardinia Drain. (Gunson 1968:90, 109-110, 137, 139, 148, 152).

Dalmore

The cancellation of the Great Swamp lease in 1874 resulted in 8,873 acres of swampland becoming available for settlement in the Dalmore area (named Dalmore in 1900). In the 1920s the remaining larger estates at Dalmore were subdivided as Italian settlers arrived in the district (Gunson 1968:90, 109-110, 136-137, 139, 148, 152, 164, 202). Following the First World War the Government purchased large landholdings in the district to subdivide into smaller lots under the Closer Settlement Scheme. Rythdale resulted from the combination of McGregor's and Hazelthorn's properties that were combined as part of the scheme (Blake

1977:232; Berwick-Pakenham Historical Society website publication 1982:136). The Rythdale area is characterised by a sandy ridge running north to south through otherwise heavy black soil. Early settlers built on this ridge because it was high and dry (Berwick-Pakenham Historical Society website publication 1982:137). It is likely that Aboriginal people utilised this ridge for the same reasons.

Pakenham

The first settler in the Pakenham region was Dr William Kerr Jamieson who established his I.Y.U. run sometime around 1838. Shortly after Dr Jamieson settled at I.Y.U James Howey and Robert Patterson took up 'Toomah' Station on the Toomuc Creek, retaining the lease until 1853. Another early pastoral lease on the Toomuc Creek was 'Mount Pleasant' held by the Minton Family until 1854. Early settlers in the area focused on pastoral activities associated with sheep and cattle farming. The Toomuc area later became an apple growing and agricultural area when John Kitchen acquired land in the area in the 1870s (Berwick-Pakenham Historical Society website publication 1982:134-136-138).

In conclusion, Aboriginal places, if present within the activity area, may be significantly impacted by:

- The clearing of native indigenous vegetation associated with agricultural and pastoral activities (grazing, ploughing, ripping) throughout the activity area.
- The installation of rural infrastructure such as fences, dams and access tracks.
- Ground disturbance associated with the drainage of swampy, low-lying areas.
- Ground disturbance associated with the construction of townships.
- Ground disturbance in the form of landscaping and infrastructure (surface and subsurface) associated with residential and commercial construction.
- Ground disturbance associated with the construction of the existing roads and road reserves in the activity area.

4.4. Historical and Ethnohistorical Accounts within the Study Area

This section provides an overview of Aboriginal culture spatial organisation as recorded at the time of European settlement. The historic accounts used to construct this section are derived from historical sources and are based on observations made of an Aboriginal society already significantly impacted by over 30 years of contact with European culture (Broome 2005:5).

The activity area is situated within the traditional lands of the Westernport tribe (generally referred to as Bun wurrung or Bunurong[1], these terms are frequently interchanged in primary accounts) and the Woi Wurrung who made up two of the seven Kulin Nation language groups (Clark:1990:364, 356). At the time of European settlement Melbourne was divided into two language groups, the Woi wurrung and Bun wurrung (Figure 6, Table 1). Clan names had the suffix –balluk/bullug, meaning a number of people or –(w)illam, meaning dwelling place (Barwick 1984:106, 1998:14). A single clan could number in the hundreds and for daily economic functioning clan members operated in smaller family-based units of 15-20 people (Presland 2010:18). The Bun wurrung were divided into six clans each of whom had strong associations with, and responsibilities for, particular tracts of land and shared an historical, genealogical and religious identity (Barwick 1984:117-118; 1998:14; Presland 2001:37, 2010:204).

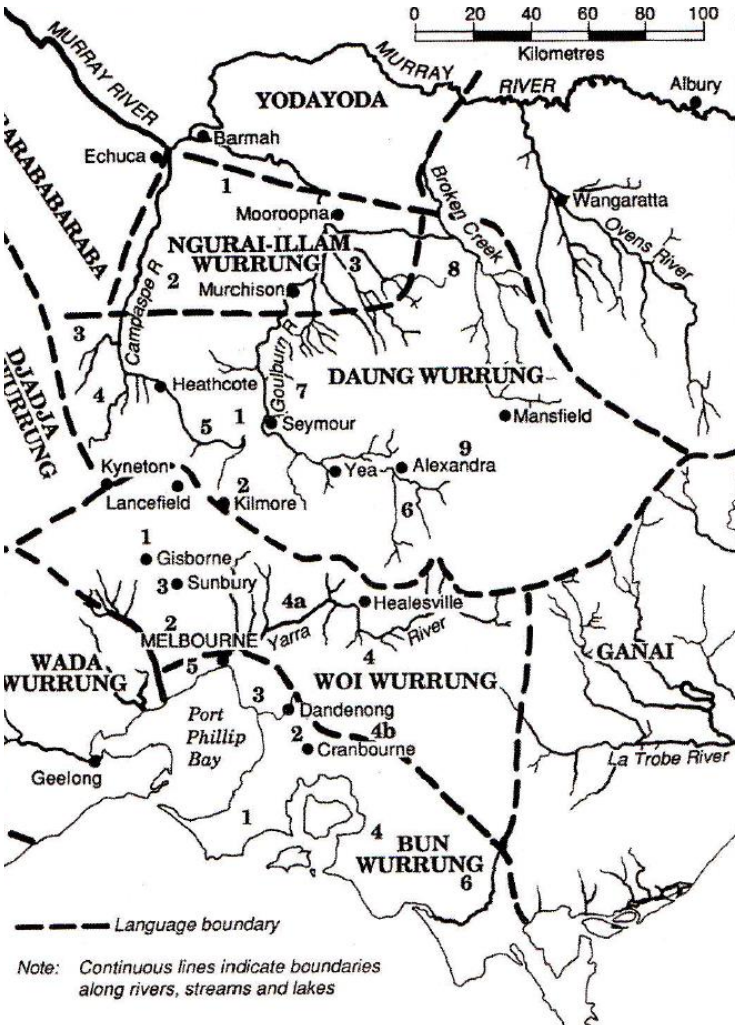

Figure 6: Map of Eastern Kulin Language Groups (taken from Clark 1990:356).

[1] The use of the different names in text is based on the term used in the reference source.

The Bun wurrung clan collectively claimed all the area in which streams drained into Port Phillip Bay of Bass Strait (Presland 2008:204). The Woi wurrung (Wurundjeri) people who occupied the watershed bounded on the north by the Great Dividing Range from Baw Baw west to Mt Macedon and by the Werribee River (Clark 1990:380) was divided into five clans who collectively claimed all the area drained by the Yarra River and its tributaries (Presland 2008:205, 2001:37).

The Kulin people shared common religious beliefs as well as languages. All Kulin members believed that the world and humans were created by the major ancestors 'Bunjil' and 'Waa'. The Aboriginal world was divided into two halves, also named Bunjil and Waa after the two creator spirits (Presland 2010:15). Mythical and creation figures were also associated with stars, planets and constellations. Venus was referred to by the Boon wurrung/Bunurong as Mirgabeen, the daughter of a long-ago chief. Orion was Karakorok, the crow that bought a firestick in his beak from the sun to the first inhabitants of the world. The crow had once been a man and felt pity for the wretched first Aboriginal people who were cold and damp and unable to cook their food (McCrae 1911:22). Thomas (1858-9:65), assistant protector, also refers to a deity called Kurukurook, who gave the Boon wurrung/Bunurong people 'their laws and form of government'.

As discussed above, the groups comprising the Kulin nation identified with one of two moieties: Waa and Bunjil (Barwick 1984:12). Barwick (1984) states that moiety affiliation transcended local allegiances. Moiety affinity was inherited from the father and determined intermarriage rules, as partners could only be obtained from a group of the opposite moiety. This led to the establishment of a highly complex and overarching network of kin relationships throughout the Kulin groups. The relationships formed by marriage alliances also affected totemic ritual and ceremonies (Presland 2010:37).

Woi wurrung Clans	Wurundjeri - willam Wurundjeri - balluk Marin - balluk Kurung jang balluk Gunung willam balluk
Bun wurrung Clans	Yalukit willam Ngaruk willam Mayone willam Burinyung balluk Yallock balluk Yowengerra

Table 1: Woi wurrung & Bun wurrung clans (taken from Presland 2001:37)

The Kulin people met regularly for inter-clan gatherings in the area that was to become the site selected for the village of Melbourne. On these occasions the different language groups would camp in locations determined by tradition. One gathering is recorded to have occurred in 1839 with between four and five hundred people gathered in the area where the Royal Botanic Gardens are located (Presland 2010:11, 40). A gathering observed by settlers in 1844 records that the Boon wurrung were camped on the spot where Government House now stands and Woi wurrung were camped on the site of Melbourne and Richmond cricket grounds (Presland 2001:47). Not all clan interactions were friendly. Historical accounts indicate that the Gippsland language group, comprising the Kurnai Nation, were enemies of the Kulin clans and conducted raids in Kulin areas. One raid recorded to have occurred shortly before European settlement is believed to have resulted in the death of many Bunurong people (Gamble 2003:4).

Thomas noted that 'when they go in large bodies, two or three seniors direct their movements from encampment to encampment' (cited in Cannon 1981:624). Some of these senior men achieved the status of 'chief', known as Arweet in the Boon wurrung clans (Presland 2010:18). The position of the senior man was not necessarily hereditary but required endorsement from the group and was recognition of a man's achievements and authority (Thomas 1858-9:63; Barwick 1984:108). The position of senior man is believed to have held no special privileges apart from exercising control in marriage arrangements and providing advice and guidance during council meetings (Presland 2010:18). Mooderrogar (also known as Budgery Tom in Thomas' diaries) was recorded by Thomas to be the owner of all the country around Carrum Swamp and across to Westernport (Fels 2011:179).

Geological resources within the landscape were utilised by each clan, with some resources such as stone artefact raw materials, known to have been traded between clans over long distances. These resources included fine grained materials such as chert and chalcedony and other siliceous stone (i.e. silcrete). Silcrete usually occurs as outcropping boulders or nodules within sedimentary deposits, this material as well as quartz, forms the stone artefact assemblages commonly identified within the region. Other materials such as ochre and kaolin, used for decorative purposes, would likewise have been utilised (Presland 2008:207). Stone was observed being used, with William Thomas, Assistant Aboriginal Protector recording 'the points of one of the spears are hardened by being slightly burnt, and some of them have barbs cut in them, while others are jagged with pieces of glass, quartz and other rough and sharp substances calculated to do the most mischief' (Thomas cited in Sullivan 1981:26). European glass was utilised to make barbed spears as noted by Thomas who recorded in his diary on

20 July 1840 that the men were not happy as they had no wax to stick the glass on their spears (Fels 2011:164).

Thomas (1858-9: 63) also describes bark shields which are shaped into a curve through the use of fire. Wood was also used for women's digging sticks and for vessels used to carry water and other goods (Sullivan 1981:26). The Mount William Aboriginal axe quarry, located near present day Lancefield and currently known to cover more than forty hectares, was an important resource used in trade in the Kulin territory. The stone axes have been traced to sites in NSW and South Australia, up to 700kms from the source. According to early European accounts access to the quarry was clearly defined and carefully controlled. Billiberry of the Wurundjeri willam was one clan leader known in the 1840s to assist in the control of this resource. Records indicate that three axe blanks could be traded for one possum skin cloak (one possum skin cloak was made from about 18 skins) which was highly prized because of the skill and workmanship involved in making them (Presland 2010:16, 74, 142-143).

Aboriginal people generally stayed close to water for its resources as well as a possible means to transverse the landscape (Presland 2008:206). An extensive list of economic resources common to the Peninsula is provided in Sullivan (1981: Appendix 2 22-29). Sullivan (1981:22-29) lists 19 different species of shellfish and 112 bird species as potential resources within the coastal system. Eels were caught in wetlands and swamps and nets were used to catch fish (Presland 2010:68). Animal resources would have included echidna, swamp rat, black wallaby, possums, wombat, kangaroos and up to forty species of birds comprising seabirds, wetland birds and woodland birds (Sullivan 1981:141). Eels were recorded as a delicacy caught in the Tooradin area (Gunson 1968:9). Food was also occasional preserved for later use with Boon wurrung groups recorded to have preserved possum and Kangaroo Rat carcasses by slowly drying them out over a fire. The meat would be kept for leaner times or for use on long journeys (Presland 2010:74).

In all Kulin clans there were specific rules regarding the way in which particular animals were cooked and distributed. These rules took into account who had made the kill and who was present in the camp (Presland 2010:60). Some food avoidances appear to have been practiced, with George McCrae recounting in his reminiscences of the Arthurs Seat area in the 1840s, 'the whole country side abounded in kangaroos, opossums, wallaby and other game, not to count the echidnas, or porcupine ant-eaters, the flesh of which, among the blacks, no one but an old man was permitted to touch' (McCrae 1911:19). Thomas also recorded that the Boon wurrung/Bunurong had the 'greatest abhorrence' for snakes and did not eat them (Thomas cited in Sullivan 1981:22).

Some of the plant resources available to Aboriginal people in the study area include bulrush, wattle gum, sea celery, coastal banksia, pigface, saltbush, coast beard-heath and climbing lignum in coastal and wetland areas (Sullivan 1981: Appendix 2). Other food resources available on the plains and in woodlands would have included Murnong (the yam daisy) which was recorded as growing abundantly along creeks and waterways by early European settlers. The Common Reed and the Spiny-headed Mat-rush were some of the plant materials collected to make baskets, fishing nets, fishing pots and necklaces. Bark was collected to make shelters, canoes (which were large enough to carry two people) and containers. The removal of bark resulted in scarred trees which were also created when toe-holes were made in order to climb a tree and catch possums. (Presland 2010:68, 71, 140-141).

Some primary resources also provide an indication of the flora and fauna resources of the region. An 1827 map by the explorer Hovell describes the vegetation in the Mordialloc area as patches of heath surrounding stringybark trees (Hibbins, Fahey & Askew 1985:73, 77). Hovell reported that in 1827 near Carrum Swamp he encountered a large party of more than one hundred Aboriginals, men, women and children. He described the women as young and healthy, each with a child. Both men and women had kangaroo skin coverings and several kangaroo dogs accompanied the party (Gunson 1968:4).

Camps were influenced by the availability of flora and fauna resources, seasonal changes, and generally by the availability of potable water. Camp spots varied in size with favourite camping spots re-used regularly. In sand dune areas camp was often set up in the swale between two dunes for shelter (Presland 2010:49-50). Thomas recorded that an Aboriginal village could be constructed in half an hour using sheets of bark. In wet weather a trench would be excavated around the perimeter of the hut to prevent rain getting in. Although huts could be assembled and dismantled quickly Thomas stated that the camp sites tended to be permanent. Popular coastal camps included Tooradin and Yallock (Gunson 1968:9-10).

Social life involved attending and producing corroborees which were held openly, unlike initiation ceremonies. During corroborees men usually painted themselves with ochre for dancing. Thomas recorded that yellow ochre and brown ochre were commonly used in corroborees and recorded the significance of bright red ochre as a sign of joy and mirth and white ochre as a sign of death and grief (Fels 2011:166). Corrobborees were observed in Woi wurrung and Boon wurrung territories on present day Parliament Hill, Emerald Hill and other elevated areas as well as close to significant waterways such as Merri Creek. Other social activities involved a ball game called ‘Marn grook’. Possum fur was used to make yarn which was then rolled into a ball and used in a game which involved kicking the ball into the air. It is

possible that Tom Wills, one of the founders of Australian Rules football, saw this game in the Western District in the 1860s (Presland 2010:77).

Historical accounts indicate that the Gippsland language group comprising the Kurnai Nation, were enemies of the Bunurong clans and conducted raids in the area. One raid recorded to have occurred shortly before European settlement is believed to have resulted in the death of many Bunurong people (Gamble 2003:4). Another raid is recorded to have occurred in 1833-34 at Tooradin when about 25 Bunurong were killed during an early morning raid by a Gippsland tribe. Reciprocal raids were carried out and the Kurnai are reputed to have referred to the Bunurong as 'Thurung', tiger snakes, "because they sneak up to kill us" (recorded by Thomas in Fels 2001:265). Thomas Maxwell Clow, son of Rev James Clow, managed Tirhatuan Station on Dandenong Creek and recorded that cairns were erected at Tooradin [possibly on the Bulla Bulla Run] for 25 Bunurong people killed during Kurnai raids (Fels 2011:260). Rev James Cow reported that 20 years after this event the grave cairns were still visible (Gunson 1968:6). Thomas recorded that monuments to the dead were also carved on trees.

Gaughwin and Sullivan (1984:89) suggest that the presence of Kow Wee Rup Swamp may have restricted past Aboriginal movement and trade between the western and eastern region of the peninsula. Tertiary silcrete available on the Morning Peninsula is found in large quantities in assemblages present west of the swamp but is present in smaller quantities in Aboriginal places recorded east of the swamp (Gaughwin & Sullivan 1984:89).

Permanent European settlement from 1835 onwards led to the depletion of Aboriginal resources through the introduction of European livestock. In a response to the depletion of Aboriginal economic resources, Thomas first asked in 1839 that the proceeds from the sale of the 895 acres of a former reserve, which is now South Yarra and Toorak and includes the site of the Botanical Gardens, be given to the Port Phillip and Western Port Aborigines so that they could purchase cattle for themselves. In 1841 he petitioned the Government not to sell any more Special Surveys because the three that had already been sold – Dendy's at Brighton, Unwin's at Bulleen and Jamieson's at Mt Martha – were all favoured fishing places of the natives (Fels 2011:16).

As a traditional lifestyle became increasingly difficult to follow Aboriginal people sought work as bullockies, stock handlers, servants and other jobs left vacant by European labourers who had left for the gold fields in the early 1850s. About 40 Woi wurrung worked on farms and stations around the Plenty River area (Broome 2005:111). A number of Boon wurrung/Bunurong men joined the Native Police (Sullivan 1981:17). Budgery Tom, a headman

of the Westernport group, enrolled in the Native Police in 1837 (Fels 1988:22). In 1838, Superintendent de Villiers attempted to recruit two Boon wurrung men, Benbow/Bondeon and Minggurer/Werram into the force, but neither could be persuaded to join (Fels 1988:27). In 1839, the Assistant Protectors were instructed to select Aboriginal men to act as domestic police. Five were selected for the Melbourne/Western Port district, two of whom were Boon wurrung/Bunurong (Fels 1988:34).

In 1841, an Aboriginal reserve was established at Narre Narre Warren. The aim of this reserve was to encourage the remaining members of the Boon wurrung/Bunurong and other groups who frequented the Melbourne area to settle in one location and adopt an agricultural way of life. From 1841, an Aboriginal camping reserve was opened at Mordialloc for the Boon wurrung/Bunurong. it comprised 822 acres on the Mordialloc Creek (Caldere and Goff 1991:7; Felton 1981:181). The Protectorate system was abolished in 1850, but Thomas was appointed Guardian of the Aboriginals of the Melbourne District and continued to keep a journal detailing his observation on Aboriginal people. Sullivan (1981:18) notes that the Boon wurrung/Bunurong were last seen on the Mornington Peninsula in 1856. After this time, they lived on the reserve at Mordialloc. One of the notable Boon wurrung/Bunurong men from this period, Derrimut, was born at Western Port and died, aged 51, in 1864. In 1836, he was painted by Benjamin Dutterreau. Derrimutt's wife was named Nan.der.gor.oke (D'Arcy 2005: 28).

By 1856, the remaining Bunurong lived mostly at 'Moody Yallock' (Mordialloc) where Thomas had secured 832 acres in 1852 to establish a reserve. From 1860, a system of depots for the distribution of rations was set up in by the Central Board for the Protection of Aborigines where station owners were appointed as Honorary Correspondents to supply rations to Aboriginal people. Many of the Honorary Correspondents supplied detailed reports to the Board on the condition of people in their area. The closest Honorary Correspondent's depot in the region was the Mordialloc depot, which was probably associated with the Mordialloc Creek camping reserve. In the last census taken of the Boon wurrung/Bunurong in 1863, 11 people remained (Third report of the Central Board Appointed to watch over the interests of the Aborigines in the Colony of Victoria 1864).

From 1872 to 1876, J. Randell was the appointed Honorary Correspondent who oversaw the depot that issued rations such as food, utensils, clothing and blankets to local Aboriginal people (Christie 1979:163). The reserve continued under various people until 1878, when many remaining Aboriginal people were transferred to Coranderrk (Caldere and Goff 1991:7; Felton 1981:182 Barwick 1998:35, 52, 66). Many Boon wurrung/Bunurong people lived on this reserve, with some ending their days there, including Yam-mer-book/Jimmy Dunbar and his

wife, Eliza, both of whom died in 1877 (Illustrated Australian News 14 May 1877; Hanrahan 1984:8).

Many locality names in the study area are derived from Aboriginal names. Gin Gin Bean or Tinginbeen is considered to be the Aboriginal name for Cardinia Creek (Gunson 1968:35) although alternative sources suggest that Cardinia means Kardinia, an Aboriginal word for sunrise (Blake 1977:61; Reed 1984:55). The name for Toomuc Creek is thought to come from timuk meaning to preparing an animal hide for a bag or cloak (Blake 1977:258) Nar Nar Goon is considered to be the Aboriginal name for koala (Blake 1977:199; Reed 1984:161). Tooradin's Aboriginal name too-roo-dun is recorded as meaning swamp monster or Bunyip (Blake 1977:259; Reed 1984:211). Tyabb's original Aboriginal name was Tyaba, meaning mud hole or land of many waterholes, and Koo Wee Rup is thought to mean Blackfish swimming (Blake 1977:262; Gunson 1968:14). Today Bunurong, Bun wurrung and Wurundjeri descendants maintain ties to their traditional lands in which the study area is situated.

4.5. Search of the Victorian Aboriginal Heritage Register & Aboriginal Places within the Study Area

A search of the Victorian Aboriginal Heritage Register (VAHR) was undertaken on 18 July 2018 by Anita Barker (Heritage Advisor). Areas of cultural heritage sensitivity occur throughout the activity area and are associated with:

- Registered Aboriginal Places r.25;
- Named Waterways r.26;
- Declared Ramsar Wetlands r.29;
- Coastal Crown Land r.30;
- Koo Wee Rup Plain r.34;
- Dunes r.40; and
- Sandsheets r.41.

Four registered Aboriginal places occur in the activity area:

- VAHR 7921-0419 (comprising an isolated surface artefact);
- VAHR 7921-0036 (comprising a subsurface artefact scatter);
- VAHR 7921-1533 Components 21 & 22 (comprising a low density artefact scatter);
- VAHR 8021-0408 Components 1-5 (comprising a low density artefact scatter).

A total of 132 Aboriginal places/place components are registered within the study area (Table 2, Figure 7 and Figure 8).

Figure 7: Aboriginal places in the study area (map 1 of 2)

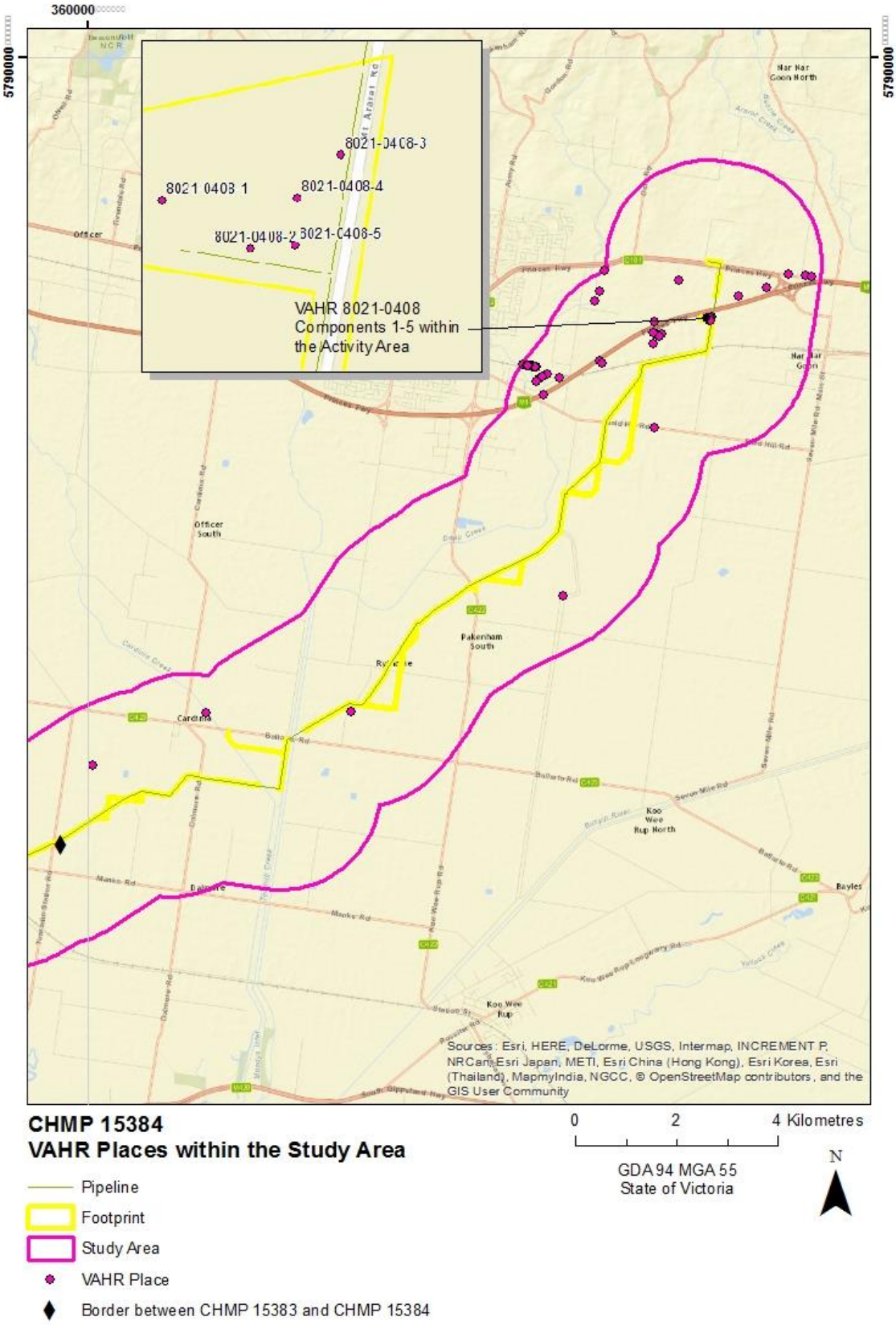

Figure 8: Aboriginal places in the study area (map 2 of 2)

VAHR No.	VAHR Name	Component No.	Place Type
7921-0006	Bunguyan Water Holes Bungunyan	7921-0006-1	Artefact Scatter
7921-0007	Shooters Camp Lagoon	7921-0007-1	Shell Midden
7921-0008	Balla Balla	7921-0008-1	Shell Midden
7921-0009	Rutherford Inlet	7921-0009-1	Shell Midden
7921-0033	Kings Ck	7921-0033-1	Artefact Scatter
7921-0036	BlueScope Western Port 1	7921-0036-1	Artefact Scatter
		7921-0036-2	Object Collection
7921-0112	O'Neils Rd	7921-0112-1	Artefact Scatter
7921-0113	The Crescent	7921-0113-1	Artefact Scatter
7921-0118	Devon Meadows 1	7921-0118-1	Artefact Scatter
7921-0119	Tooradin 1	7921-0119-1	Artefact Scatter
7921-0121	Tooradin Estate 1	7921-0121-1	Artefact Scatter
7921-0126	Smiths Lane 1	7921-0126-1	Artefact Scatter
7921-0128	North Road 1	7921-0128-1	Artefact Scatter
7921-0186	Bass Highway 1	7921-0186-1	Artefact Scatter
7921-0304	Fisheries Road	7921-0304-1	Artefact Scatter
7921-0354	Hastings Hist. Society Artefacts	7921-0354-1	Object Collection
7921-0359	Hendersons Road 2	7921-0359-1	Artefact Scatter
7921-0367	Warrangine Creek 1	7921-0367-1	Artefact Scatter
7921-0368	Warrangine Creek 2	7921-0368-1	Artefact Scatter
7921-0369	Jacks Beach 1	7921-0369-1	Shell Midden
		7921-0369-2	Artefact Scatter
7921-0419	Warringine Creek 1	7921-0419-1	Artefact Scatter
7921-0463	Tyabb 1	7921-0463-1	Artefact Scatter
7921-0568	Tyabb Orchard 1	7921-0568-1	Artefact Scatter
7921-0625	Matthews Rd 1	7921-0625-1	Artefact Scatter
7921-0841	Bungower Rd IA 1	7921-0841-1	Artefact Scatter
		7921-0841-2	Object Collection
7921-0360	Hendersons Road 1	7921-0360-1	Artefact Scatter
7921-1428	Hastings IA 2	7921-1428-1	Artefact Scatter
7921-1427	Hastings IA 1	7921-1427-2	Artefact Scatter
7921-1449	Terry Street LDAD	7921-1449-1	LDAD
		7921-1449-2	LDAD
		7921-1449-3	LDAD
		7921-1449-4	LDAD
		7921-1449-5	LDAD
		7921-1449-6	LDAD
7921-1452	Hastings Street 1	7921-1452-1	LDAD
7821-0885	Warrener 1 Shell Midden	7821-0885-2	Object Collection
7921-1523	Daveys Bay Shell Midden	7921-1523-4	Object Collection
7921-1528	Watson Creek	7921-1528-1	Artefact Scatter
		7921-1528-2	Artefact Scatter
		7921-1528-3	Artefact Scatter
		7921-1528-4	Artefact Scatter
		7921-1528-5	Artefact Scatter

7921-1529	Landale Road 1	7921-1529-1	Artefact Scatter
7921-1533	Warragul to Hastings LDAD 2	7921-1533-3	LDAD
		7921-1533-4	LDAD
		7921-1533-5	LDAD
		7921-1533-6	LDAD
		7921-1533-7	LDAD
		7921-1533-8	LDAD
		7921-1533-13	LDAD
		7921-1533-14	LDAD
		7921-1533-15	LDAD
		7921-1533-16	LDAD
		7921-1533-17	LDAD
		7921-1533-18	LDAD
		7921-1533-19	LDAD
		7921-1533-20	LDAD
		7921-1533-21	LDAD
		7921-1533-22	LDAD
		7921-1533-23	LDAD
7821-0905	Rosebud Foreshore Coastal Shell Midden 6	7821-0905-3	Object Collection
7821-0946	Boorunun	7821-0946-2	Object Collection
7821-0947	Wigal	7821-0947-2	Object Collection
7821-0948	Yal	7821-0948-1	Object Collection
7821-0958	Mynggrook	7821-0958-2	Object Collection
7921-1673	Warragul to Hastings LDAD 4	7921-1673-2	LDAD
		7921-1673-3	LDAD
7921-1724	Baxter-Tooradin Road LDAD 1	7921-1724-1	LDAD
7921-0305	Station Road 1	7921-0305-1	Artefact Scatter
7921-0949	Hobson 1	7921-0949-1	Artefact Scatter
7921-0970	Cardinia 3	7921-0970-1	Artefact Scatter
8021-0110	Deep Creek 1	8021-0110-1	Artefact Scatter
8021-0111	Deep Creek 2	8021-0111-1	Artefact Scatter
8021-0112	Deep Creek 3	8021-0112-1	Artefact Scatter
8021-0144	PB3 M1	8021-0144-1	Artefact Scatter
8021-0145	PB3 M2	8021-0145-1	Artefact Scatter
8021-0146	PB3 M3	8021-0146-1	Artefact Scatter
8021-0147	PB3 M4	8021-0147-1	Artefact Scatter
8021-0148	PB3 N8	8021-0148-1	Artefact Scatter
8021-0149	PB3 P11	8021-0149-1	Artefact Scatter
8021-0150	PB3 P13	8021-0150-1	Artefact Scatter
8021-0161	Bald Hill 1	8021-0161-1	Artefact Scatter
8021-0162	Bald Hill 2	8021-0162-1	Artefact Scatter
8021-0163	Bald Hill 3.	8021-0163-1	Artefact Scatter
8021-0186	Bald Hills Estate 1	8021-0186-1	Artefact Scatter
8021-0227	McDonalds Drain Scar Tree	8021-0227-1	Scarred Tree
8021-0240	PB3M5	8021-0240-1	Artefact Scatter
8021-0250	Bald Hill 4	8021-0250-1	Artefact Scatter

8021-0379	Deep Creek 13	8021-0379-1	LDAD
		8021-0379-2	LDAD
		8021-0379-3	LDAD
		8021-0379-4	LDAD
8021-0380	Nar Nar Goon IA 1	8021-0380-1	LDAD
8021-0385	Deep Creek 14	8021-0385-8	LDAD
		8021-0385-9	LDAD
		8021-0385-10	LDAD
		8021-0385-11	LDAD
		8021-0385-12	LDAD
		8021-0385-13	LDAD
		8021-0385-14	LDAD
		8021-0385-15	LDAD
		8021-0385-17	LDAD
		8021-0385-18	LDAD
		8021-0385-19	LDAD
		8021-0385-20	LDAD
		8021-0385-21	LDAD
		8021-0385-22	LDAD
		8021-0385-23	LDAD
		8021-0385-24	LDAD
		8021-0385-25	LDAD
		8021-0385-26	LDAD
		8021-0385-27	LDAD
		8021-0385-28	LDAD
8021-0387	185 Oakview Lane, East Pakenham	8021-0387-1	LDAD
		8021-0387-2	LDAD
		8021-0387-3	LDAD
		8021-0387-4	LDAD
		8021-0387-5	LDAD
		8021-0387-6	LDAD
		8021-0387-7	LDAD
		8021-0387-8	LDAD
		8021-0387-9	LDAD
		8021-0387-10	LDAD
		8021-0387-11	LDAD
8021-0408	185 Oakview Lane, Pakenham East LDAD 2	8021-0408-1	LDAD
		8021-0408-2	LDAD
		8021-0408-3	LDAD
		8021-0408-4	LDAD
		8021-0408-5	LDAD

Table 2: Registered Aboriginal places & place components within the study area (places within the activity area are highlighted grey)

The VAHR data for the registered Aboriginal places show that place types are predominantly Low Density Artefact Distributions (LDADs) (51.5%) and artefact scatters (37.1%). The remaining places comprise shell middens (3%) and object collections (7.6%) with one scarred tree (0.8%) present (Table 3). Within the study area no Aboriginal Historic places or preliminary reports are listed on the VAHR database.

VAHR Place Type	Count	%
Artefact Scatter	49	37.1%
LDAD	68	51.5%
Object Collection	10	7.6%
Scarred Tree	1	0.8%
Shell Midden	4	3.0%
Total	**132**	**100%**

Table 3: Summary of Aboriginal places & place component types in the study area

4.6. Previous Archaeological Investigations within the Study Area

The following section reviews broad regional archaeological investigations undertaken in the study area: Mornington Peninsula (Sullivan 1981); Westernport (Gaughwin 1981; Gaughwin & Sullivan 1984); Berwick-Pakenham Corridor (Smith 1991); and the Melbourne Metropolitan area (Presland 1983). This provides information on the distribution and character of Aboriginal places within the study area. This is followed by a discussion of five localised studies (CHMP 13065, CHMP 13991, CHMP 10200, CHMP 12826 and CHMP 13355) that have been undertaken in the study area and have assessed part of the current activity area.

Regional Studies

Sites of Archaeological Significance in the Westernport Catchment (Gaughwin 1981)

An archaeological survey of the Western Port Catchment undertaken by Gaughwin (1981) provides useful information on the regional distribution of Aboriginal places. Gaughwin used data on Aboriginal place location, place contents, landforms, and subsistence resources in conjunction with historical records to develop an Aboriginal subsistence model for the Western Port Catchment. Gaughwin sample surveyed the three main landforms that make up the catchment coastal margins, upland hills and coastal plains (1981, 33). Within the coastal plains Gaughwin surveyed an area of 266ha, with most of this being comprised of inland areas of Phillip Island, French Island and the northern sections of Western Port Bay. A total of 14 Aboriginal places were identified. These consisted of stone artefact occurrences and a single raw material quarry. The majority of places were located on the interface between higher ground in proximity to wetlands and swamps (1981:113).

Gaughwin (1981:130-136) notes that campsites in the region were generally temporary and would have varied in size from several households to large encampments of 30 huts (150 people). Smaller campsites associated with daily resource activities were more common and larger campsites usually reflect larger social/religious gatherings. The remains of the campsites in the archaeological record are likely to be in the form of cooking hearths and stone tools. Forging territory is estimated to have been 8-10km from the campsite whose location and use was determined by the availability of resources such as eels.

Gaughwin (1981:133-136) points out that ethnohistorical accounts indicate that the margins of swamps, lagoons, rivers, lakes and creeks, areas of inland plains and elevated level areas near water are areas of increased archaeological significance. Coastal occupation was probably seasonal and brief as indicated by the lack of stratified deposits identified during archaeological investigations. Occupation of the Cranbourne Sands landform likely focused on elevated areas in between swamps and other water sources with food resources available year-round. Ethnohistorical accounts indicate that there were many swamps contained within the ridges of sand. Gaughwin (1981:134) highlights that high ground close to food resources and available water would have been favoured campgrounds.

Report No.193 Aboriginal Boundaries and Movements in Western Port, Victoria (Gaughwin & Sullivan 1984)

Gaughwin and Sullivan (1984) examined historical evidence relating to the Bunurong people of the Western Port and Mornington Peninsula areas in Victoria. This study is largely based on William Thomas' (Assistant Protector of Aborigines) accounts. Additional observations by settlers and visitors to the area are also examined. The authors investigated boundaries, population size, economy and movements, and external relations as defined by Aboriginal people in the area. This research was done in order to supplement archaeological surveys of the Western Port and Mornington Peninsula areas for the purposes of cultural heritage management. The authors note that preliminary archaeological evidence indicates that the Koo Wee Rup swamp may have restricted movement between Aboriginal people east and west of the swamp (Gaughwin & Sullivan 1984:89).

An Archaeological Survey of the Mornington Peninsula (Sullivan 1981)

Sullivan (1981) undertook an archaeological survey of the Mornington Peninsula in order to identify Aboriginal places and define areas of potential archaeological sensitivity in order to provide a framework for the management and protection of Aboriginal places. The survey focused on coastal areas and a total of 289 of 328 registered Aboriginal places were re-

identified. The majority of places comprised shell midden deposits with 86% of places recorded within 100m of the shoreline. Only 27 places (9%) were noted to occur inland with the remaining 14 places (5%) located along potable water sources and raised dune systems in close proximity to wetland/swampy areas. Sullivan suggests the survey highlights that Aboriginal resource procurement was focused on the exploitation of littoral sources, with archaeological and ethnohistorical sources indicating travel routes along the coastal margins passing through the centre of the Mornington Peninsula from Cape Schanck to the shores of Tootgarook Swamp areas (Sullivan 1981:64, 96, 120).

Stone artefact assemblages present at these places are generally low-density artefact scatters dominated by silcrete raw material (Sullivan 1981:57, 64). The analysis of the stone artefacts indicates that the assemblages are characteristic of the Australian Small Tool Tradition (ASTT) and are likely to be dated to last 6,000 years BP. This suggests that the Mornington Peninsula was likely to have been a focus of Aboriginal occupation during the mid-late Holocene after sea levels stabilised with resources targeted along the coastline and swamp (Sullivan 1981:96, 120).

An Archaeological Survey of Melbourne Metropolitan Region (Presland 1983)

Presland (1983) conducted an archaeological survey of the Melbourne Metropolitan area as part of the Victorian Archaeological Survey (VAS) program. This survey involved the synthesis of ethnohistorical and archaeological records as well as a field assessment. Given the size of the study area the field assessment involved opportunistic sampling of different landscape units within the study area – with particular focus on areas that had undergone little or no development and where Aboriginal places were considered most likely to occur.

Landscape Unit 5, the eastern foreshore of Port Phillip Bay, consisting predominately of coastal sand dunes with some sandstone outcrops, rock platforms and cliffs was not surveyed but a desktop assessment was undertaken. Presland noted that the dune stretching from Mordialloc to Frankston is of Tertiary age. Vegetation in this landform is generally low bushes and swamp scrub with Aboriginal resources comprising both rocky platform and sandy shore shellfish species as well as fish and possibly bird-life (Presland 1983:9-10). Native wells recorded by Massola in 1959 were relocated along the coastline between Beaumaris and Blackrock with the coastal fringe between Ricketts Point and Red Bluff considered to be of similar significance and potential. However, the majority of the landscape unit was noted to have been subjected to residential development and been drastically disturbed with a consequent loss of archaeological evidence (Presland 1983:15, 60, 90).

Landscape Unit 2, undulating plains (south of Dandenong Ranges to Westernport Bay with elevation less than 300m) were surveyed over 21 days and 27 Aboriginal places were identified. The Aboriginal places comprised predominately artefact scatters with four scarred trees recorded predominately along watercourses, or in close proximity to permanent streams. The highest density places were located on elevated landforms near potable water. Within Landscape Unit 3, low hills with an elevation of less than 100m (including the foothills of the Dandenong Ranges) landforms comprising low hills, crests, slopes and bases of the hills were surveyed and along Cardinia Creek. Two scarred trees and isolated artefacts were recorded within this landform. The isolated artefacts occur predominately on the crests and upper slopes of hills (Presland 1983:57-63).

Berwick-Pakenham Corridor (Smith 1991)

Smith (1991) conducted an archaeological assessment of the Berwick-Pakenham Corridor, which extends either side of the Princes Highway between Dandenong and Bunyip and includes Pakenham. Four landscape units consisting of undulating hills, lowland plains, floodplains and Cranbourne Sands are represented within the study area. Due to limited ground surface visibility and the large size of the study area only 0.26% of the study area was effectively surveyed. The nature and distribution of sites was considered to be tentative due to the very low effective survey coverage (Smith 1991:28). A total of 62 Aboriginal sites were identified during the survey comprising 32 stone artefact scatters, 15 isolated stone artefacts and 15 scarred trees. A summary of the site types and estimated site densities for each landform is listed below.

Undulating Hills: Artefact scatters and isolated stone artefacts were present in high proportions with artefact scatters generally occurring within 50m of permanent watercourses. Isolated artefacts were the most common site type present on hill slopes and ridges. Limited numbers of scarred trees were identified.

Lowland Plains: Artefact scatters were the most common site type within this landscape unit with most sites located within 50-150m of permanent creeks. Scarred trees were present in high proportions but were generally restricted to floodplains within lowland plains, and creek banks within 50m of creeks.

Floodplains: The distribution of artefact scatters in this landform unit was predicted to be generally lower than in other landform zones. Scarred trees were present in high proportions.

Cranbourne Sands: No scarred trees were identified within the Cranbourne Sands landform and only small amounts of artefact scatter occurrences were present. However, an analysis

of site density indicated that this landform had the highest density of stone artefact occurrences with 833 sites estimated to occur per km².

Smith (1991) suggests that the results of the survey reflect the distribution and abundance of water and food resources with Cardinia Creek appearing to have been the focus of activity within the Berwick-Pakenham Corridor and may have been used as a path from the coast through Koo-Wee-Rup Swamp to the hills in the north. Smith suggests that the distribution of Aboriginal sites may reflect spatially restricted activities. Differences in the stone tool assemblage indicate that Aboriginal sites in the south west section of the corridor appear to be associated with the manufacture and use of wooden tools and implements; while Aboriginal sites in the eastern section appear to be associated with blade production. Stone raw material source and distribution patterns indicate that some raw materials were traded between the coast and the corridor (Smith 1991:57-8).

Localised Studies

CHMP 12826 ESSO Pipeline Replacement Project (Mathews, Albrecht & Endacott 2015)

Mathews et. al. (2015) undertook a CHMP for a proposed 74.8km long oil pipeline alignment (350mm wide and 900mm below the ground) involving the replacement of an existing pipeline. The replacement pipeline was, as far as practicable, constructed adjacent to the existing pipeline and within existing easements. Three landform units were identified as being present in the activity area: Koo Wee Rup Plains; Westernport; and Warragul-Drouin Hills. The Standard Assessment was hampered by poor ground surface visibility nevertheless in areas of increased visibility 50 Aboriginal stone artefacts were identified during the survey. In the Koo Wee Rup Plains survey area artefacts were identified on small elevated sandy rises. In the Westernport survey area artefacts were identified on well drained, elevated and gently inclined land. In the Warragul-Drouin Hills survey area artefacts were found on a range of landforms and in close proximity to Hazel Creek.

As part of the CHMP Complex assessment subsurface testing was undertaken in 47 discrete areas identified over three landforms (Koo Wee Rup Plains, Westernport and Warragul-Drouin Hills). The areas targeted for testing were based on the degree of previous disturbance, its archaeological potential (landform, proximity to water, elevation, vegetation, and the presence of Aboriginal cultural heritage) and discussions with the Aboriginal stakeholder groups. No testing was undertaken above the existing pipeline due to safety concerns and the level of prior disturbance. The subsurface testing was undertaken in two phases, Phase 1 involved landform testing and Phase 2 involved radial testing. The presence of the existing pipeline

constrained the location of radial test pits. In total 13 1x1m test pits, four 50x50cm test pits and 478 40x40cm shovel probes were excavated. Of these 57 shovel probes, two 50x50cm test pits and five 1x1m test pits contained Aboriginal cultural material.

Of particular interest to this report is the results of the subsurface testing undertaken on the Koo Wee Rup Plains and Westernport landforms. 14 areas were tested on the Koo Wee Rup Plains and Aboriginal cultural material was identified at three locations. Within the Westernport landform 16 areas were tested and Aboriginal cultural heritage was identified at 11 locations. The Koo Wee Rup Plains contained the highest density of artefacts (n=46) followed by the Westernport landform (n=28). The overall artefact density was low with 75% of the artefact bearing pits containing between one and ten artefacts. Silcrete was found to dominate the artefact assemblages on all three landform types followed by quartz.

During subsurface testing one additional artefact was identified at previously registered place VAHR 7921-0036. As a result of the CHMP Assessment four new Aboriginal places were registered: VAHR 7921-1528 artefact scatter containing 21 artefacts; VAHR 7921-1529 artefact scatter containing 44 artefacts; VAHR 8021-0395 LDAD containing 42 stone artefacts; and VAHR 7921-1533 LDAD containing eight artefacts.

CHMP 10200 Westernport Industrial Subdivision, Hastings (Wheeler, Lane & Matarese 2009)

Wheeler, Lane and Maltese (2009) undertook a CHMP for a proposed industrial sub-division of 532 ha in Hastings, Victoria. The landform was identified as a low relief coastal landscape characterised by gently undulating rises with broadly spaced and shallow incised drainage lines. Due to the varying nature of the landform, excavation was undergone on a variety of landforms. The Desktop Assessment identified two previously registered sites VAHR 7921-0036 and VAHR 7921-0037 in the study area. 359 ha of this proposed study area was used to conduct both the Standard and Complex Assessments. The Standard Assessment identified two surface scatters consisting of three flakes in a previously disturbed area.

The Complex Assessment involved both manual and mechanical excavation of 42 5x1.2m trench pits and eight 1x1m test pits to the level of B horizon subsoil. The eight test pits were conducted in areas where the Standard Assessment had identified two artefact scatters. In total, the Complex Assessment identified 265 stone artefacts (registered as VAHR 7921-0036, which includes surface sites VAHR 7921-0036 and VAHR 7921-0037) in 29 of the 42 test trenches and seven of the eight test pits. The author determined that VAHR 7921-0036 represents a continuous scatter of varying density across the entire study area. Although the author indicates a trend towards higher density artefact scatters and proximity to water,

statistical analysis reveal that it is not significantly greater than what is expected by chance. The same can be said for the artefact scatter distribution in relation to landform sloping, with a trend for higher density artefact scatter being greater in higher sloping regions, yet still statistically insignificant.

CHMP 13355 Fibre Optic Cable between AusNet Terminal Station and Blue Scope Steel, Tyabb, Victoria (Ward, Szydzik & Power 2015)

Ward et. al. (2015) undertook a CHMP for a proposed installation of fibre optic cable along a 2x1450m corridor. The Desktop Assessment indicated that previously identified Aboriginal place VAHR 7921-0036 was within the study area. The standard assessment was performed with approximately 8% effective coverage estimated. Two landforms were identified as gentle slopes and flat plains. The Complex Assessment involved one 1x1m stratigraphic test pit and 20 400x400mm shovel test holes up to 600mm in depth. Subsurface testing did not yield any artefacts.

CHMP 13065 Train Maintenance Depot, Pakenham East (O'Connor 2014)

O'Connor (2014) completed an assessment for a CHMP activity area comprising paddocks, a railway line and road reserves in Pakenham East. Prior to commencement of CHMP 13065, one isolated artefact (VAHR 8021-0163 LDAD) had been previously recorded on a lowland plain landform within the study area, approximately 400m from Deep Creek. The desktop assessment identified that rises and escarpments close to nearby waterways were the most archaeologically sensitive landforms within the study area.

For the purposes of the ground surface survey, the study area was divided into five investigation areas based on landform types, degree of disturbance and archaeological sensitivity. Ground surface visibility varied across the study area, ranging from 5%-70%. No Aboriginal cultural material was identified during the survey. Occasional mature native trees were encountered during the survey, however, none contained evidence of Aboriginal scarring.

The subsurface testing program focussed on sensitive landforms, such as rises, within the study area, with less intensive testing undertaken on low-lying and flat areas. One 1x1m test pit and 94 40x40cm shovel test pits were excavated. The 1x1m excavation pit revealed a subsurface soil profile of silt overlying coarse, sandy silt before reaching firm sterile clay. Soil deposits were relatively shallow with most of the test pits terminating at a depth between 400-600mm. Twelve stone artefacts were identified in eight shovel test pits during the subsurface investigation which was registered as VAHR 8021-0387 LDAD. Most of the artefacts were

located on a rise at the highest point of the study area. The results were said to be consistent with the findings of other archaeological investigations in the region, suggesting that European settlement of the area has heavily modified the landscape and impacted the survival and intactness of Aboriginal cultural material.

CHMP 13991 Pakenham East Train Maintenance Depot (Matthews 2016)

CHMP 13991 was undertaken for the same activity as CHMP 13065 apart from the addition of three extra land parcels. Place inspections of VAHR 8021-0163 and VAHR 8021-0387 were undertaken as part of the CHMP assessment but did not result in the identification of any further Aboriginal cultural material at these place locations. A total of three 1x1m test pits (TP) and 89 50x50cm shovel test pits (STPs) were excavated. One new Aboriginal place (VAHR 8021-0408) was identified during the CHMP assessment in the upper 100-400mm deposits: comprising one quartz and four silcrete stone artefacts identified on a broad gentle rise. This place was registered as an LDAD and the artefacts were collected during the CHMP assessment. It was determined that the excavation program carried out as part of CHMP 13065 and CHMP 13991 demonstrated that no dense deposits of Aboriginal cultural material occur in the activity area. No salvage program was outlined in CHMP 13991 which provided protection measures for VAHR 8021-0408. These protective measures included the installation of temporary protective fencing to ensure that VAHR 8021-0408 is a no-go zone during the CHMP 13991 activity.

4.7. Desktop Assessment Summary

Areas of registered Aboriginal cultural heritage sensitivity occur throughout the activity area and are associated with watercourses, landforms and registered Aboriginal places. A search of the Victorian Aboriginal Heritage Register (VAHR) shows that six Aboriginal places occur in, or within, 50m of the activity area with four of these places occurring in the activity area:

- VAHR 7921-0419 (comprising an isolated artefact) occurs within the activity area;
- VAHR 7921-0036 (comprising an artefact scatter) occurs within the activity area;
- VAHR 7921-1533 Components 21 and 22 (comprising a low density artefact scatter) occurs within the activity area;
- VAHR 8021-0408 Components 1-5 (comprising a low density artefact scatter) occurs within the activity area;
- VAHR 7921-1427 (comprising an artefact scatter) occurs with 50m of the activity area; and,

- VAHR 7921-1533 Components 7 and 8 (comprising a low density artefact scatter) occurs within 50m of the activity area.

A review of archaeological investigations undertaken in the study area indicates that:

- Scarred trees may be present in areas of remnant mature native vegetation;
- There is increased potential for Aboriginal cultural material to be present on elevated landforms (rises, crests, hills), on sandy dunes and in close proximity to watercourses which would have provided attractive long-term occupation areas;
- There is increased potential for Aboriginal cultural heritage to be present in the Cranbourne Sands (which occur throughout the activity area within the Koo Wee Rup Plains);
- Low-lying land and floodplains have lower potential to contain Aboriginal cultural heritage but cannot be ruled out due to the availability of resources year-round;
- Aboriginal cultural material, if present, is likely to comprise LDADs and artefact scatters manufactured predominately on silcrete and quartz raw material; and
- There is limited potential (based on ethnohistoric accounts) for burials to be present in sandy/silt deposits in the Tooradin area.

5. Triggers for Approvals

Under Division 1 of the Regulations a CHMP is required for an activity if all or part of the activity area for an activity is considered to be an area of cultural heritage sensitivity and all or part of the activity is a high impact activity (r.7 of the regulations).

A CHMP is required for this activity as areas of cultural heritage sensitivity occur in the activity area. These areas relate to:

- Registered Cultural Heritage Places VAHR 7921-0036, VAHR 7921-0419, VAHR 8021-0408 (Components 1-5) and VAHR 7921-1533 (Components 21 & 22) - r.25 (1) VAHR 7921-1533 (Components 7 & 8) and VAHR 1427 – r.25 (2);
- Named Waterways Warringine Creek, Kings Creek, Olivers Creek, Langwarrin Creek, Deep Creek, Cardinia Creek, Toomuc Creek, Lower Gum Scrub Creek and Rutherford Creek that occur in the activity area - r.26;
- Declared Ramsar Wetlands that occur within 200m of the activity area - r.29;
- Coastal Crown Land within the activity area – r.30;
- Koo Wee Rup Plain within the activity area – r.34;
- Dunes within the activity area – r.40; and,

- Sandsheets within the activity area – r.41.

Under r.46 (xxvii) (B) the activity is a high impact activity as it is a linear project that is the construction of a pipeline with a length exceeding 500m.

Under r.25 (3), r.26 (2), r.29 (2), r.30 (2), r.34 (2), r.40 (2) and r.41 (2) if an area has been subject to significant ground disturbance, that part is not an area of cultural heritage sensitivity. Significant ground disturbance under r.5 of the Regulations means the disturbance of:

(a) the topsoil or surface rock layer of the ground; or

(b) waterway – by machinery in the course of grading, excavating, digging, dredging or deep ripping, but does not include ploughing other than deep ripping.

Therefore, in order for the proposed activity on the subject property to be exempt from the requirement for a CHMP to be prepared, the entire area of cultural heritage sensitivity would need to have been previously subject to significant ground disturbance as defined in the Regulations.

6. Conclusions & Recommendations

The desktop assessment has identified that Aboriginal cultural heritage and areas of Aboriginal cultural heritage sensitivity occur in the activity area and will be impacted by the activity, which is defined as a high impact activity under r.46.

Aboriginal cultural heritage in the form of a stone artefact scatter (VAHR 7921-0036) and low density artefact distributions (VAHR 7921-0419, VAHR 7921-1533 Components 21 and 22, VAHR 8021-0408 Components 1-5 LDADs) are present in the activity area and will be impacted by the activity. VAHR 7921-1427 and VAHR 7921-1533 Components 7 and 8 occur with 50m of the activity area and the place extents for these sites may be impacted by the activity. Some areas of cultural heritage sensitivity in the activity area may have been subject to previous ground disturbance as outlined in Section 4.3. However, ground disturbance is unlikely to have occurred to the entire area of cultural heritage sensitivity within the activity area as defined under r.5. Therefore, a CHMP is required.

The proposed activity will occur in Bunurong Land Council (BLC) Registered Aboriginal Party (RAP) area from Crib Point to Tooradin, and in a non-RAP area from Tooradin to Pakenham. Therefore, two Cultural Heritage Management Plans (CHMPs) are recommended and have been commissioned by APA Transmission Pty Limited and comprise:

- CHMP 15383: Crib Point to Pakenham Gas Pipeline (Crib Point to Tooradin) in the BLC RAP area. A Notice of Intent (NoI) was submitted to Aboriginal Victoria, Department of Premier and Cabinet on 4 November 2017 and to Bunurong Aboriginal Corporation Land Council (BLCAC) on 6 November 2017. BLCAC confirmed on 12 November that the RAP would be the evaluating authority for CHMP 15383. BLCAC have been consulted throughout the course of the CHMP preparation and are involved in the fieldwork (Standard and Complex Assessments) currently underway.

- CHMP 15384: Crib Point to Pakenham Gas Pipeline (Tooradin to Pakenham) in the non-RAP area. Aboriginal Victoria will be the evaluating authority for CHMP 15384 as no RAP is present in CHMP 15384 activity area. Three Aboriginal stakeholder groups have interest in the CHMP 15384 area: Boon Wurrung Foundation; Wurundjeri Land and Compensation Cultural Heritage Council Aboriginal Corporation; and Bunurong Aboriginal Corporation Land Council. The Aboriginal stakeholder groups attended an inception meeting for CHMP 15384 held on 19 December 2017 and have been involved in the fieldwork (Standard and Complex Assessments) currently underway.

Section 4 of this report has been drawn from CHMP 15383 and CHMP 15384 draft desktop assessments. The CHMP will provide a framework as per Section 61 of the *Aboriginal Heritage Act* 2006 in which to manage Aboriginal cultural heritage identified in the activity area during the CHMP assessment. The CHMP will also provide contingencies in the event that Aboriginal cultural material (expected and unexpected) is discovered during the activity. Therefore, the CHMP will allow for any impact to Aboriginal cultural heritage by the activity to be appropriately managed.

References

- 1864. *Third Report of the Central Board Appointed to Watch Over the Interests of the Aborigines in the Colony of Victoria*.

- 1877. *Illustrated Australian* News 14 May 1877.

Barwick, D. 1984. Mapping the Past: An Atlas of Victorian Clans 1835-1904. *Aboriginal History* 8: 100-31.

Barwick, D. 1998. *Rebellion at Coranderrk*. Aboriginal History Monograph 5, Aboriginal Affairs Victoria, Melbourne.

Blake, L. 1977. *Place Names of Victoria.* Rigby Limited, Melbourne.

Broome, R. 2005. *Aboriginal Victorians: A History Since 1800*. Allen & Unwin, Crows Nest NSW.

Caldere, D. and D. Goff, 1991. *Aboriginal Reserves and Missions in Victoria,* Melbourne: Department of Conservation & Environment.

Cannon, M (ed). 1981*. Historical records of Victoria. Foundation Series. Vol 2. Aborigines and Protectors 1838-1839.* Australian Government Printing Press, Melbourne.

Christie, M. 1979. *Aborigines in Colonial Victoria 1835-86*. Sydney University Press, Sydney.

Clark, I. 1990. *Aboriginal Languages and Clans: An Historical Atlas of Western and Central Victoria, 1800-1900*. Monash Publications in Geography 37.

Cochrane, G.W., Quick, G.W. & Spencer-Jones, D. 1999. *Introducing Victorian Geology*. Geological Society of Australia (Victorian Division), Melbourne.

Costermans, L. 2008. *Native Trees and Shrubs of South Eastern Australia*. New Holland Publishers, Australia P/L.

Cronin, L. 2008. *Australian Wildlife.* Jacana Books, Crows Nest, NSW.

D'Arcy, J. 2005. *Bunurong Land Council Historical and Genealogical Report*. Unpublished Report Prepared for the Bunurong Land Council, Aboriginal Corporation.

Fels, M. 1988. *Good Men and True. The Aboriginal Police of the Port Phillip District 1837 – 1853.* Melbourne University Press, Melbourne.

Fels, M. 2011. *I Succeed Once: The Aboriginal Protectorate on the Mornington Peninsula 1839-1840*. ANU Press.

Felton, P. 1981. Victoria: Land Reserved for the Benefit of Aborigines 1835-1971. In N. Peterson, (ed.), *Aboriginal Land Rights: A Handbook*. Australian Institute for Aboriginal Studies, Canberra.

Gamble, L. 2003. *Mentone Through the Years.* Published by Como Parade, East Melbourne.

Gaughwin, D. 1981. *Sites of Archaeological Significance in the Westernport Catchment*. La Trobe University, Melbourne.

Gaughwin, D. & H. Sullivan, 1984. Aboriginal Boundaries and Movements in Westernport, Victoria. *Aboriginal History 8* (Part 1):80-98.

Gunson, N. 1968. *The Good Country: Cranbourne Shire*. F. W. Cheshire Publishing P/L, Melbourne.

Hibbins, G. M., Fahey, C. & Askew, M. R. 1985. *Local History*. Allen & Unwin, Sydney.

Jenkins, J. 1962. *The Geology and Underground Water Resources of the Tooradin Area.* Geological Survey, Minister of Mines.

Matthews, D. 2016. *Pakenham East Train Maintenance Depot: CHMP 13991*. Unpublished Report to Public Transport Victoria.

Mathews, D., Albrecht, M. & Endacott, E. 2015. *ESSO Pipeline Replacement Project (Western Section): CHMP 12826.* Unpublished Report to ESSO Australia.

McCrae, G. 1911. The Early Settlement of the Eastern Shores of Port Phillip Bay with a note on the Aborigines of the Coast. *Victorian Historical Magazine* 1: 7 – 26.

Menkhorst, P. & Knight, F. 2004. *A Field Guide to the Mammals of Australia*. Oxford University Press, South Melbourne, Victoria.

Nelson, P. & Alves, L. 2009. *Lands Guide*. Public Records Office of Victoria, North Melbourne.

O'Connor, A. 2014. *Train Maintenance Depot, Pakenham East: CHMP 13065*. Unpublished Report to Public Transport Victoria.

Presland, G. 1983. *An Archaeological Survey of the Melbourne Metropolitan Area.* Unpublished Report to VAS.

Presland, G. 2001. *Aboriginal Melbourne.* Harriland Press, Forest Hill.

Presland, G. 2008. *The Place for a Village: How Nature Shaped the City of Melbourne*. Museum Victoria Publishing, Melbourne.

Presland, G. 2010. First People: *The Eastern Kulin of Melbourne, Port Phillip & Central Victoria.* Museum Victoria.

Reed, A. W. 1984. *Place Names of Australia*. Reed Books P/L.

Smith, L. 1991. Berwick-Pakenham Corridor*. Aboriginal Archaeology.* The Victorian Archaeological Survey and the Minister for Planning and Environment Occasional Report No. 45.

Sullivan, H. 1981. *An Archaeological Survey of the Mornington Peninsula*. Victoria Archaeological Survey Occasional Report Series, No 6. Ministry for Conservation Victoria.

Thomas, W. 1858-9. *Responses. Report of the Select Committee of the Legislative Council on the Aborigines Together with the Proceedings of the Committee, Minutes of Evidence and Appendices*. John Ferres, Government Printer, Melbourne.

The Advisory Committee on Recreation & Tourism to the Westernport Regional Planning Authority. 1971. *Victoria's Playground – The Westernport Region*. Stockland Press, North Melbourne.

Ward, B., Szydzik, S. & Power, R. 2015. *Fibre Optic Cable between AusNet Terminal Station and Blue Scope Steel, Tyabb, Victoria: CHMP 13355.* Unpublished Report to AusNet Asset Services.

Wheeler, J., Lane, S. & Matarese, L. 2009. *Westernport Industrial Sub-Division. Hastings, Victoria: CHMP 10200.* Unpublished Report to Lefta Corporation.

Zola, N., & B. Gott. 1992. *Koorie Plants Koorie People: Traditional Aboriginal Food, Fibre and Healing Plants of Victoria.* Koorie Heritage Trust, Melbourne.

Websites

https://www.casey.vic.gov.au/lists/casey-directory/Berwick-Pakenham-Historical-Society-Inc

http://trove.nla.gov.au/

https://cv.vic.gov.au/organisations/berwick-pakenham-historical-society-inc/

http://vro.agriculture.vic.gov.au/dpi/vro/wgregn.nsf/pages/wg_vegetation_res_evc

https://www.environment.vic.gov.au/biodiversity/bioregions-and-evc-benchmarks